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ORIGINAL ARTICLES.

APPLICATIONS OF ELECTRICITY TO MEDICINE.

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Ever since the seventeenth century attention has been more or less directed to the action of electricity on the human body. Experimenters previous to that time, had been unable to generate electricity save in very small quantities; but about that period the electric machine was invented and, as this instrument furnished an unlimited supply of electricity, those of a philosophical turn of mind sought to learn the effects of the new "effluvium" upon all kinds of matter. The effect of the discharge upon the human body was noted with a great deal of awe and surprise. Imagination seems to have been greatly stirred by the fire which was drawn from the sulphur and glass balls that formed the machines, for, in their memoirs, we find them describing in a most vivid style the effects of the electric sparks.

Professor Van Muschenbrock, who discovered the Leyden jar, describing his discovery to his friend Professor Reaumur, in a letter dated April 20th, 1746, declared "that he would not submit to a second shock for the whole kingdom of France." "I wish to communicate to you a new but terrible experiment," he writes to Reaumur, "which I advise you not to repeat to yourself. I was making some researches in the force of electricity, and had suspended by two silk cords an iron rod, one end of which received the charge from an electrical machine; from the other end hung down a thin wire which dipped in a thin flask partly filled with water, and which I supported by my right hand while I endeavored to draw a spark from the rod by my left. Suddenly my right hand received a violent shock and my whole body was struck as if by an explosion of gunpowder. The flask although made of thin glass was not broken nor was my hand misplaced, but my arms and body were affected in a terrible manner which I cannot explain, but which I thought would make a finish of me."

M. Allamand, who repeated this experiment shortly after with a common glass tumbler, says: "The shock took my breath away and I felt such a violent pain in my arms as to fear serious consequences, but it passed over without injury to me."

Professor Winckler, of Leipzig, speaking of his experience in repeating the Leyden experiment upon himself, said that he felt strong convulsions over his whole body, his blood was brought into a most violent agitation, and a burning fever would have been the result if he had not taken cooling medicines. He felt also a heaviness in his head as if a stone laid upon it; it caused him twice to bleed at

the nose, which otherwise seldom took place. He tried the experiment on his wife on two different occasions. He says, "she was so weakened that she could not walk, and a week later, on receiving the third shock, she commenced at once to bleed at the nose."

All the early experimenters seem to have had a very high estimate of the power of electricity when accumulated in the Leyden jar to work harm to anyone receiving the charge. One philosopher, M. Boze, wished to be killed by the electric shock, "in order that the account of his scientific death might procure an article for the Memoirs of the French Academy of Sciences." His wish was not fulfilled.

The electric shock produced by the Leyden jar was the cause of so much interest that many persons travelled over Europe and made a living by administering it; some pretending to cure by it all manner of diseases. We see a relic of this in the man with the electric shocking-machine who is so often seen on the street corner, and is a regular accompaniment of the country circus.

In France, the celebrated Abbé Nollet hastened to repeat the Leyden Jar experiments, and many crowded to experience the new sensation. One day, finding that the number of persons who wished to take the shock was inconveniently great, he conceived the idea of having them join hands in the form of a ring and administering the shock to the whole company at once. This trial having been so successful, the experiment was repeated at Versailles in the presence of the king and his court. A company of about two-hundred and fifty soldiers were placed in a line, each holding the other by the hand. The Abbé placed himself at one end of the human chain, while a soldier at the other end held the charged bottle of water in his hand. As soon as Nollet plunged his finger in the water the circuit was closed and the shock was instantaneously communicated to each man in the line, much to the amusement of His Majesty and his courtiers. Subsequently Abbé Nollet killed fish and birds by means of the jar, thus indicating that the experiment might be pushed too far with human beings.

Aloysius Galvani, Professor of Anatomy at the University of Pavia, having been occupied for a long time with the study of the nervous system, was curious to see what effect would be produced upon the living organism by the "electric fluid" and experimented upon different animals with the view of determining this question.

In 1790, while engaged in this line of study, he noticed that a leg dissected from a living frog, when attached by the crural nerve to the metal part of the electrical machine, suffered contraction on being touched by the scalpel, even though the machine was not operating. Continuing his observations further, he found that whenever the metal hook attached to the nerve was touched by the scalpel resting on the muscle, the latter suddenly contracted. Galvani, being a physiologist and not a physicist, naturally sought for an explanation of the phenomena in the vital economy. He was familiar with the contractions produced by the electric spark, and attributed the phenomena just described to an electricity inherent in the animal, assuming that the electricity which he called "vital fluid" passed from the nerves to the muscles by the joining metals and was thus the cause of the contraction. This theory met with great support, especially among the physiologists, but it was not without opponents. The most important of these was Alexander Volta, Professor of Physics in Pavia, one of the foremost physicists of his age. As soon as Galvani announced his observation, he set to work to repeat the experiment. Galvani's attention had been exclusively devoted to the nerves and muscles of the frog, Volta's was directed upon the connecting metal. Resting on the discovery which Galvani had made that the contraction is more energetic when the connecting arc is composed of two metals than when there is only one, Volta attributed to the metals the active part of the phenomenon of contraction. He assumed that the disengagement of electricity was due to their contact, and that the animal parts officiated as conductors and at the same time as a very sensitive electroscope.

A memorable controversy arose between Galvani and Volta. After much further experimentation the latter was led to give greater extension to the contact theory, and propounded the theorem that, "when two heterogeneous substances are placed in contact, one of them always assumes the positive and the other the negative electrical condition." In this form Volta's

theory obtained the assent of the principal philosophers of his time. Galvani, however, made a number of highly interesting experiments with animal tissues. In some of these he obtained indications of contraction even though the substances in contact were quite homogeneous.

Though later research has shown the truth of Volta's theory, yet Galvani has not been proved to be entirely wrong, for modern investigation has proved conclusively that the muscles are the seat of an electro-motive force and may be made to produce currents of electricity. This was first discovered by Galvani, but he was not given the credit due him as, at that time, investigators did not possess instruments sufficiently delicate to prove the existence of the delicate currents produced by the muscles.

Since the time of Galvani much attention has been given to these muscle and nerve currents by Nobilli, Nattenucci, and, especially in later years, by Du Bois Reymond who also investigated the laws governing them. These investigations proved most conclusively that currents do exist in living muscles and nerves. These inherent currents are probably the cause of some of the uncertainties which at times attend the use of light currents of electricity in medicine, and, until they are more thoroughly studied and become better understood we will likely not be able to make positive statements with regard to the dosage of electricity.

A great deal of good has undoubtedly been accomplished by those skilled in the application, but one who is unacquainted with the fundamental laws of electricity should not think of using this method of treatment to any great extent before thoroughly familiarizing himself with the laws governing its action. Few of our medical colleges have the assurance that their graduates are well-informed on the principles of electricity or other branches of physics; and the young physician is compelled to obtain the knowledge elsewhere if he wishes to be successful in electro-therapeutics.

In operating with electricity one has to deal with three quantities which are mutually dependent upon one another. These are *electro-motive force* or potential, *resistance* and *current*. The *electro-motive* force, or as it is often called the potential, is estimated by *volts*, and is the cause by which electricity is set in motion in a voltaic circuit. The *quantity* of electricity which in any unit of time flows through a a section of the circuit, is called the strength of the current. This *strength of current* is evaluated in *amperes* and *milliamperes*, the latter being the one-thousandth part of the former. The *resistance*, as its name indicates, is a quantity depending on the amount of obstruction offered to the free passage of the current. The unit of resistance is called the *ohm*, and is the resistance offered by a column of pure mercury one hundred and six millimetres long, having a square millimetre section.

The relations existing between these quantities is expressed by "Ohm's law," which is: that the current forming in any circuit is directly proportional to the electro-motive force, and inversely proportional to the resistance; or to express this relation symbollically,

$$\text{Current (C)} = \frac{\text{Electro-motive force (E)}}{\text{Resistance (R)}}.$$

The only one of these quantities that is usually observed with any great care in medical applications is the strength of the current (C). But due regard must also be had for the other two, for the value of C, as the voltage is raised or the resistance decreased, increases accordingly. The voltage may be raised by adding more cells of battery. The resistance is dependent on the character and dimensions of the circuit. The metals, particularly copper and silver, are excellent conductors; the muscles, nerves and bones are only fair conductors; while dry skin is a very poor conductor. By increasing the length of the current path we increase the number of obstructions that the current has to overcome and thereby raise the resistance. By increasing the area of cross section of the conductor the number of paths are increased by which the current passes from one pole to another, and thus lessens the resistance. The electric current on entering a homogeneous conductor spreads out and passes in parallel lines to the neighborhood of its point of exit, where it gathers together and passes out by the pole attached at that point. When the current is caused to pass through a non-homogeneous conductor, as for example, an arm or leg of a human being, the current distributes itself more or less in the bones, muscles and nerves, according as they offer less or

more resistance. As dry skin is a poor conductor, the electrodes used in applying the current are usually faced with sponge which is kept moist, and are made of as large an area as possible, unless for some particular purpose it be desired to concentrate the excitation at one point.

Electricity may be made to manifest itself in several different ways, and in medicine these are distinguished from one another by a nomenclature peculiar to this science. Frictional or static electricity is generally called "Franklinism"; current or voltaic electricity is commonly called "Galvanism"; while induced alternate currents are spoken of as "Faradism."

Frictional electricity, or Franklinism, is produced by the friction of two dissimilar substances. Everyone is more or less familiar with electricity in this form. Examples of it are often seen in the dry winter season. In such weather if one shuffles his feet over a heavily carpeted floor and then touches any piece of metal work, such as the gas fixture, a bright spark will spring from him to the metal; on combing the hair with a rubber comb, sparks are also evident. Any substance will display evidences of electrification on being rubbed by something of a different composition, but the best materials for the generation of frictional electricity are glass and an alloy of zinc, tin and mercury. Many of the machines used to-day in generating electricity for Franklinization, consist of circular plates of glass revolved between rubbers covered with the above alloy. A new machine invented by Holtz, operating on the induction principle, is rapidly coming into use in consequence of its greater reliability in all kinds of weather.

Current electricity or Galvanism.—Whenever two metals are immersed in a liquid which acts chemically upon one of them, they are brought to different states of electrification, which is expressed by saying that one is at a higher electric potential than the other. There always exists a tendency for these different electrical states to equalize each other, and if the two metals be joined together equalization will instantaneously take place and electricity will flow from the higher potential metal to the lower through the point of connection. As long as the liquid continues to act chemically on one of the plates this condition of higher and lower potential will be maintained between the two metals, and a continuous current of electricity will flow across the connection. This will be noticed by the sense of taste. If the tongue be placed between a copper and a silver coin, no particular taste will be noticed so long as they do not touch, but so soon as their edges are brought into contact, taste is excited. This is due to a current of electricity passing through the tongue from one metal to the other. This effect is much more noticeable if a scrap of zinc be used in place of the silver coin. By employing a liquid that is capable of acting with more vigor than the saliva, a more powerful current is obtained. If a piece of zinc and one of copper be placed in a solution of sulphuric acid, and their free ends be joined by a wire, it will be noted that as the acid attacks the zinc a current commences to move along the wire. This current can manifest itself in several different ways. If the wire bearing the current be brought near a compass-needle the latter will be deflected, and if allowed to flow for a time the wire will become warmed by the action of the current on the molecules composing the wire. If the wire be cut in two and the two ends be brought together on the tip of the tongue a peculiar sensation will be felt in this organ, and an acid taste will be noticed at one wire, while the other will have a different taste difficult to describe.

For the application of galvanism in medicine a numberless variety of batteries have been devised. Many answer the purpose for which they were designed, but most of them, except the chloride-of-silver cell, are bulky and troublesome. This has contributed not a little to render electricity unpopular with the general practitioner, and has confined its use largely to the specialist.

The third grand division of medical electricity is called "Faradism," and considers the application of induced alternating currents. The production of these currents depends upon the principle discovered by Michael Faraday, that: "when a current of electricity is started flowing in one coil of wire, another current is induced in any other coil of wire which may be near the first; and that on shutting off the current from the first coil, a current opposite in direction to the previous induced current is generated in the coil that is near by." The customary instrument for producing these currents is called an induc-

tion coil, and consists of about fifty or sixty turns of covered, coarse, copper wire wound on a soft iron core. This is called the "primary" coil. Over the primary, and carefully insulated therefrom, are wound many turns of covered, fine copper wire, forming the "secondary" coil. To the primary is connected cells of a battery, the current from which is automatically made and broken many times a minute. Each time the current in the primary is made and broken, two currents, one negative the other positive, are induced in the secondary. This piece of apparatus is generally so arranged that the potentials at the terminal of the secondary may be varied through wide limits, in order that the intensity may be adapted to different cases. The old "shocking machine," or "medical battery" which was in such common use a quarter of a century ago, was a Faradic instrument and produced alternating currents of a high potential. In this machine the energy which was transformed into electricity was derived from the person who turned the crank, while in the induction coil the source of energy is in the supply of chemicals contained in the voltaic cells.

In the static form, first electricity was used for curative purposes, but for years was almost entirely supplanted after the advantages of dynamic electricity came to be better understood. At present it is being used to a somewhat greater extent, but the benefits accruing from its employment come, probably, more through the mind than the point of application. For this reason Franklinization has been used with great success in the treatment of those maladies where the imagination has been the chief source of trouble.

Dr. Rockwell, an eminent authority on electro-therapeutics, says: "Sedative and tonic effects of a very interesting character are undoubtedly obtained through franklinization, but these effects are hardly equal in variety or degree to those which follow the careful and thorough use of dynamic electricity. None the less, however, do we hail the recent revival of this neglected department of electro-therapeutics, not only because in some conditions it may possess some advantages, but because through peculiar idiosyncrasies it is sometimes better borne than the other forms. It must not be forgotten, however, as a rule general faradization is far more agreeable than treatment by sparks, however carefully given. Another important reason for the use of franklinic electricity—and one, which, to my gratification I have thoroughly tested—is its occasional value in supplementing and reinforcing the constitutional tonic effects of general faradization."

Current electricity or "galvanism" has been used to a great extent and for a variety of purposes in medicine, with practical results. A continuous current of electricity produces two distinct effects in passing through the human organism. One is an electrolytic action whereby the substances traversed by the current which are capable of decomposition by this means are broken up into their constituents. This electrolytic action has been found, when developed in a mild degree, to materially assist nutrition. Thus Professor Thacher, of Yale, found as the result of experimentally applying the current alternately to the two arms of a paralytic for the period of one week each, that at the end of every week the arm which had been galvanized during the previous seven days had improved about fifty per cent. in strength over the member which during that time had depended on nature alone.

The other action of a continuous current is a species of osmose and may be shown by immersing a glass tube, closed at the bottom with a piece of parchment and filled with fresh water, in a vessel of salt water. If the positive pole of a battery be placed in the salt water and the negative pole in the fresh, after a time it will be noted that the water in the glass tube has become salty, and that the solution has there risen to a higher level. Here the action of the current has been to mechanically carry along the salt and fluid from the positive to the negative pole. This action has been entitled electric osmose, and has been recently used to force below the skin those drugs which do not affect the cuticle and generally have to be applied hypodermically. Cocaine has thus been successfully injected below the epidermis by moistening the positive sponge with cocaine and applying to the surface that one desired to anesthetize. This method of treatment has been used with satisfactory results to quiet the pain of neuralgia. At one time it was thought that this would afford an excellent way of administering all medicines which could

be reduced to solutions. Many tried "medicated electric baths," but the impossibility of regulating the quantity absorbed by the patient prevented their use to any great extent.

The galvanic current has been used to a great extent by all specialists in this department of medicine, and with very satisfactory results. A decided difference of opinion exists as regards the methods of application, all, however, agree that no success can be attained with galvanism without the aid of the galvanometer. This instrument tells just how much current is flowing between the electrodes. This is important to know, as without its aid one may be readily deceived, for the same number of cells and equal pole surface on the same subject may give quite different readings on two succeeding days, due to the changed condition of the person on whom the current is operating.

After the electrodes are in place the current may be increased or decreased by altering the number of voltage. This is accomplished by increasing or decreasing the number of cells in the circuit. This method would be illy suited to many cases, as it lacks delicacy of regulation. A better plan is to regulate the current with a rheostat. This instrument contains a resistance which can be varied from small to infinite dimensions, and is designed to be placed in the circuit with the batteries and the body operated upon. In using the rheostat the regulating handle is placed at the infinite point, and after the electrodes have been put in position the batteries are connected with the circuit and the resistance is diminished until the desired current is flowing at a strength which may be maintained by slight movements of the handle. Another advantage gained by the use of the rheostat is that the patient need suffer no shock on the making and breaking of the circuit, as the current can be gradually reduced from the highest to an infinitely small value before the circuit is broken.

The "Faradic," or as it is sometimes called the "induced" current, consists of a rapid succession of electrical impulses alternately moving in opposite directions, and is known as an "alternating current." As electricity moves with practically infinite velocity, each impulse (a current) passes from one pole of the apparatus through the circuit to the other pole before another current, opposite in direction, can start from the latter pole around the circuit. Thus we have travelling in the circuit a succession of currents which are opposite in direction, the one being positive the other negative. A similar result would be obtained if the terminals of a voltaic cell were led to a commutator or pole changer. In operating the latter each end of the battery would be alternately connected with the two ends of the circuit and thus send currents around the circuit which would be alternately positive and negative in direction of movement. In order to produce an alternating current with the apparatus just described equal to that generated by an ordinary induction coil it would be necessary to employ many cells of battery and a very rapidly moving commutator. This would make a clumsy and cumbersome arrangement and is never employed when the compact induction coil is available. The faradic current, consisting as it does of currents whose direction is changed many times a second, cannot produce the electrolytic or osmotic effects which we noticed in connection with the voltaic current. For whatever decompositions or changes might be made by an electrical impulse at one instant, would be destroyed the next by the succeeding impulse which moves in the opposite direction. It is supposed that the faradic current obtains its therapeutical value from the sudden reversals of the current, which, stimulating the nerves, causes them to throw the muscles into action.

For the purpose of applying the faradic current, as well as for the other varieties, electrodes of many shapes and sizes for particular applications have been devised, but the most generally useful is the hand. Professor Rockwell says: "The hand is the natural electrode, and those who are able to bear the requisite strength of current through their own persons and are willing to subject themselves to the fatigue which follows its frequent use in this way, will find it unrivalled by any other form of electrode. It is not absolutely necessary that the hand be used, but it can be readily understood that no artificial electrode that human skill can devise can equal the hand in its flexibility, and the readiness and completeness of its adaptation to every inequality of surface. In all applications to the head, eyes, and face,

and in more general treatment of acutely susceptible and hysterical women, one will fail in numberless ways to obtain the same results by any form of artificial electrode. Ordinarily, however, when the applications are made along the course of the spine and over the abdomen and lower limbs, the strength of the current necessary is too powerful to be passed through the arms of any operator and, fortunately, artificial electrodes answer here as good a purpose as the hand."

The discomfort and inconvenience arising from the customary method of using the hand as an electrode may be avoided by employing the contrivance devised by the author for this purpose. Attached to the wrist of the hand is a flexible metallic bracelet, lined on the side in contact with the flesh of the operator with sponge or other bibulous material. Attached to the bracelet is a flexible rubber-covered wire by which the current is brought from the induction coil. In order that perfect freedom of movement of the hand may be maintained, the insulated wire is carried along the arm to the shoulder where it is fastened to the clothing and is thence led to the induction coil. The current arriving by the wire passes into the hand by the wrist and thus much annoyance arising from the faradization of a large part of the body of the operator is avoided, and the ill effects which are sure to follow such a practice are limited to the hand. As the two hands may be used alternately the ill effects will be minimized.

In all the preceding applications of electricity the current has passed directly into the body or some portion of it, but there is another class of applications in which the electricity is indirectly used, being first transformed into some other form of energy, as light, heat, sound or mechanism. Prominent in this class is the "Galvano-cautery," in which instrument a strong current from a storage battery, a small dynamo, or a powerful galvanic battery, is led by stout copper wires to the terminals of a short platinum wire which is thereby maintained at a white heat. On touching muscle or membrane with this glowing wire it is immediately cauterized.

The electric light is now being used to a considerable extent for making an optical examination of many of the cavities of the body, such as the stomach, bladder, vagina and the rectum. A specially designed instrument is required for each of these organs, but in general they consist of a thin metallic tube at the end of which is a small incandescent light for illumination, and a small prism to reflect the wall of the illuminated cavity down the tube to the eye of the observer. The wires which feed the lamp are often carried down the inside of the tube, the interior of which is coated with lampblack to avoid reflections. In one of these instruments which was designed for protracted examinations the visual tube was paralelled by two others; one for the electric wires, the other for a stream of water to regulate the heat generated by the wires and lamp. A great deal of ingenuity has been expended on this class of instruments, and they have greatly aided the specialist in obtaining an idea of the internal appearance of many of the organs in health and in the various stages of disease, but to obtain satisfactory results from their use requires considerable skill, practice and patience.

The electric motor is being used more and more. Surgeons and dentists have found the small hand motor armed with a rapidly operated saw or drill, extremely useful for many delicate operations which by the ordinary methods require the exercise of considerable manual labor. With the aid of the electric motor the operator is relieved of all labor and can concentrate his whole attention on the action of the tool. The work being performed with extreme rapidity the patient is relieved from prolonged distress. Very often when hard work has to be performed it will be found advantageous to employ the motor, and allow the current to supply the energy necessary. The "electric plugger" has been made to do excellent work in the hands of the skillful dentist. A similar instrument has been used for massaging small surfaces.

An electrical instrument which possesses great capabilities is the microphone. When used in connection with a cell of battery and a telephone, it renders audible extremely faint sounds arising from the action of different portions of the human mechanism. The sounds produced by the action of the lungs and heart are heard much magnified in the telephone and the sound produced by the contraction of a muscle is also made audible.

The graphophone has been used for recording and comparing coughs peculiar to different troubles.

The electric probe or explorer was invented for discovering bullets or other foreign metallic substances which might become embedded in the body. These instruments have been devised on two or three different principles. One consists of a pair of wires firmly fastened together but insulated from each other, with the terminals, which are inserted in the wound, slightly separated from one another. When these terminals come in contact with any metallic substance the circuit is closed and a bell is rung by a battery which is also in the circuit. Another piece of apparatus for discovering the position of bullets is based on the principle of the Hughes induction balance. This instrument has not been much used, as one of its first applications was in the case of the late President Garfield, where a stupid blunder caused the instrument to give erroneous results. In order that correct results may be obtained with the induction balance, the patient must be removed from the neighborhood of all metallic substances, as bed-springs, etc., materially interfere with useful results. Under proper conditions it can be relied upon, and when this becomes better understood no doubt it will receive wider application.

The great draw-back to the use of electricity by the general practitioner has been the trouble and annoyance of keeping the batteries always in order when the need for their use may be only occasional. No doubt this will be avoided in the near future, as now but few towns are without the incandescent light service, and this most satisfactory illuminant is rapidly replacing gas and other illuminants in residences everywhere. With the incandescent electric current, (either continuous or alternating) it will be a simple and not very expensive matter to replace the cumbersome batteries with a motor-generator designed to furnish the different kinds of current which may be needed by the physician. Such an arrangement would possess the advantage of being ever ready without requiring any previous attention on the part of the physician or his assistants, as the companies furnishing the incandescent light maintain a constant pressure in their mains during the whole twenty-four hours. Its safety is without question, for the wires on the motor-generator bearing the street current would be entirely separate and thoroughly insulated from those carrying the current furnished by the machine for medicinal purposes.

When such motor-generators are placed on the market at reasonable prices, and their capabilities are understood by the profession, we shall find electro-therapeutics much more widely practiced and more highly prized than it is even at this present time.

SPINAL SYMPTOMS IN RELATION WITH HYSTERIA.*†

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If diseases, like crimes, were amenable to the laws, the victims of the disease in question would long since have crowded our reformatory institutions, for this disease represents the most dangerous and accurate of all counterfeits. So clever is the imitation, so innocent the mien of the individual who presents this false picture, that great skill is oftentimes required in the detection; and it is not strange that men of experience and learning should occasionally fail in their judgment and accept the spurious representation as genuine coin.

Despite the apparent irregularity and

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† This paper is based largely upon the admirable article on hysteria in Charcot and Bouchard's "Traite de Medecine," Vol. v.

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diversity of its symptoms, so that hysteria has been spoken of as possessing the forms of Proteus and the hues of the chameleon, the manifestations of this disordered mental state are governed by fixed laws, and possess certain characteristics, peculiar to themselves, which always serve for identification.

It is one of the great triumphs of clinical medicine in our day and generation that the recognition of this neurosis, whose limits are as yet ill-defined, as a disordered mental state should have become general belief; and it is to Charcot that we are principally indebted for this acquisition. The old idea of the intimate association of this disease with uterine disturbance, from which, indeed, the malady received its name, is no longer current. It is true that the great Sydenham had taught that the uterus was by no means an essential factor in the development of hysterical symptoms, for he described hysteria in the male, and showed that many cases in women were wholly independent of organic lesion in the pelvis; but his teachings were not sufficient to change the prevalent opinion that hysteria was especially a disease of the female sex, and in some manner always more or less intimately connected with the organs of generation.

It is to-day scarcely proper to speak of hysteria as a neurosis. It is true that there is no anatomical basis for classifying it with organic disorders, that it must be regarded as functional, but we should substitute for the word neurosis another which more accurately fits the case, and should speak of hysteria as a psychosis. It is to Charcot, again, that we owe our knowledge of the dominant influence of some fixed idea in producing many of the gravest symptoms, as certain forms of paralysis coming on after injuries, contractions, hyperesthesia, anorexia, loss of speech, etc. This fixed idea, once firmly established in the mind, becomes so powerful that it cannot be controlled, and finally realizes those objective symptoms of which it was, in the first instance, but a mental picture.

It is not within the scope of this paper to trace the influence of either the predisposing or exciting causes, such as, in the former category, the influence of age, sex, heredity, and, in the latter, of mental or physical shock, of the infectious or other acute diseases, of various forms of intoxication. There is this to be said, however, in regard to the development of hysteria as a result of traumatism, that, in these cases, there is usually a greater mental shock than physical injury inflicted. The injury itself only determines the point of localization at which the hysterical manifestations show themselves later in the patient's history. It is the fright or terror accompanying the physical violence, often insignificant in degree, which leaves a certain disturbance in the mind of the patient, an emotional state, that ultimately leads to the appearance of objective symptoms, projected towards the periphery from this central disturbance.

Lastly, I may allude merely to a fact well known to all, the influence of imitation in the development of symptoms in those who are from any cause predisposed to hysteria.

The consideration of the clinical picture of hysteria whatever form may be assumed by the symptoms offers for our study two classes of phenomena, one being stable, permanent, often existing without the knowledge of the patient, the other more irregular, often intermittent, though lasting a long time, generally more conspicuous than the indications of the first class. The former are the more important for our study, inasmuch as it is by their recognition that the true nature of the malady is revealed; they constitute the evidence in the case, and usually last as long as the altered mental state continues; the incidents of of the second class are not essential to the clinical picture, often are entirely wanting, and, when present, are frequently determined by some accidental condition wholly independent of the causes of the original attack.

The fundamental troubles, the stigmata, are of three classes—sensory, motor and psychical.

The sensory are again subdivided into anesthesia, hyperesthesia, and dysesthesia. First in importance, and most striking of all, are the anesthesias. Their presence had long been recognized, though their nature was not understood. Many a poor hysterical patient has doubtless suffered the death penalty on the charge of sorcery, or has served as evidence against those accused of this offense, because of the loss of cutaneous sensibility, as evidenced by imperfect response to pricking, burning or tearing of the skin. The name stigmata

is derived from this period, for the anesthetic areas were called the marks of the devil, *stigmata diaboli*. Hysterical anesthesia may extend to sensations of every kind. It may be partial or complete. It may affect only one variety of common or special sensibility, or several of these simultaneously. It may be superficial or deep, and may involve either the skin or mucous membrane or both. Sensibility may be only diminished or completely abolished. It may happen, though such cases must be of the greatest rarity, that there are no disturbances in any of the forms of sensation. So unusual is this occurrance, that the perfect preservation of the sensory function is in itself enough either to cast a doubt upon the diagnosis, or to raise a suspicion as to proper care in the investigation of the case.

Anesthesia of the skin may appear in the most varied forms. There may be perfect perception of contact, yet no response to painful impression, to pricking, pinching or burning, to heat or cold, or to electrical stimulation; or each of these in turn may be retained with loss of any or all the others, though it will rarely happen that the sense of contact is alone abolished. Failure to respond to painful impressions is known as analgesia, mere diminution without loss of sensibility is called hypesthesia, the total abolition of sensibility is known as anesthesia.

Loss of deep sensibility, affecting the muscles, bones, articular surfaces and glandular organs, is by no means uncommon. It is in such cases that we find it possible to traverse with long needles the entire thickness of a limb, or of the hand, to give abnormal and strained positions to the joints, to subject such sensitive organs as the testicles to great pressure, without eliciting any manifestation of pain.

Among the most interesting of sensory disturbances is the loss of the muscular sense. This can be placed in evidence in one of many ways. In the first place, unusual strain upon the muscles, as when a limb is maintained in a trying position for an unusual length of time, gives rise to no sensation or manifestation of fatigue. Positions, which under ordinary circumstances could only be assumed by trained athletes, and then only for a short time, are maintained almost for an indefinite period, because of the impairment of the muscular sense. Another method of testing for this sensibility is by asking the individual to lift simultaneously in the two hands, let us say, objects of unequal weight. Now, the healthy individual, before making such an effort, gauges by means of his muscular sense, the degree of resistance to be overcome in the act of lifting, and proportions the muscular effort in accordance with his judgment. Where the muscular sense is absent, the effort is likely to be in no way adjusted to the work in hand, so that it is either excessive or inadequate, and is more than likely to be made with the same force upon the two sides, so that the lighter weight is often raised with great velocity. A third test of the muscular sense, in so far as it relates to position, is made by having the patient close his eyes, giving to the arm or leg of one side a certain position, and then requesting him, with the eyes still closed, to give to the corresponding member of the opposite side, a similar position. The effort usually results in failure, where the muscular sense is defective.

There may be absolute or partial insensibility of all mucous surfaces. As related to the spinal cord, I mention only the mucous membrane of the vagina and vulva, of the urethra, and of the anus and rectum.

Now it will happen in but the fewest cases, that there is general anesthesia, *i.e.*, over the entire cutaneous surface; more commonly it is one lateral half of the body; or what seem to be irregularly disseminated islands of anesthesia in the midst of a perfectly healthy skin. Sometimes these latter assume the form of bands or bracelets, or geometrical figures, whose boundaries for the most part are perpendicular to the axis of the limb; the peculiarity of this distribution is, however, always such that it cannot be explained by anatomical distribution of any nerve or set of nerves, or by any central lesion, a symptom so noteworthy that it alone suffices for the diagnosis of hysterical anesthesia. Hemi-anesthesia, which is very common, is oftentimes more difficult of diagnosis. According to the French authors, the left side suffers more frequently than the right. It may or may not be accompanied by anesthesia of the mucous membranes on the same side. Occasionally there is failure of the special senses on the same or on the opposite side. Where

it is the opposite side, a central cause can, of course, be excluded, and the hysterical origin of the trouble is clear.

One of the most important landmarks in the recognition of all hysterical anesthesias is the preservation of the deep reflexes. The patellar reflex, the ankle reflex, the cremasteric, the abdominal, the respiratory reflex, following the application of cold to the skin, are all maintained. The same is true of the pupillary reflex to light, to accommodation, and that reflex dilatation of the pupil, which can always be noted when any sensory surface is subjected to pain. Even where the painful impression is made upon the area of hysterical anesthesia, this reflex dilatation of the pupil will occur if the irritation be of sufficient intensity.[1]

A second fact, well known to clinicians, is the inconstancy of localization of hysterical anesthesia. The area may shift from one side of the body to a corresponding area upon the opposite side, either with or without the assistance of magnets and other appliances, the so-called phenomenon of transfer. Violent emotions, injuries of any kind, the momentary effect of remedies of various kinds may all cause a temporary restoration of sensibility in areas previously anesthetic; the same phenomenon may occur during sleep, or when the attention is profoundly engaged upon some subject outside of the patient's personal condition, or in the hypnotic trance or state of somnambulism.

A curious and important fact in relation to hysterical anesthesia is that it often exists without the patients knowledge. Patients will very often rest under the suspicion of simulation. Many features in connection with the cases will strongly suggest malingering; yet the anesthesia in these cases is real though it does not seem to cause the patient any annoyance, mainly because he is ignorant of its existence.

The most explicit and interesting theory of the causation of the anesthesia has been given by Janet. According to this author hysterical anesthesia is a species of distraction. He compares the central perceptive area for sensations to the sensory expansion in the retina, and draws a parallel between visual perceptions and those of general sensibility in this way; that, inasmuch as there may be limitation of the visual field, so there may be, in cases of hysterical anesthesia, limitation of the field of consciousness. The individual has lost the power of receiving more than a limited number of impressions from certain parts of the surface.

Now, no individual is capable, even in health, of assimilating, if this word may be employed, all of those elementary sensations, such as those of sight, hearing, touch, taste, muscular sense, etc., which he is constantly receiving, because the attention is always engaged in prepondering degree with one or the other variety, so that the remaining sensations, which are real, though not accurately perceived, remain in a state of sub-consciousness, and are neglected.

The largest number that can be simultaneously recognized as distant impressions may be said to represent the field of consciousness of the individual. Now, according to Janet, where the field of consciousness is limited, so that the number of elementary sensations perceived as such is below the normal, it will ultimately happen that those sensations which are least perceived become lost altogether, just as an individual with eyes of unequal strength will gradually learn to neglect the sight of the impaired globe, and will use for fixation and for accurate vision the stronger eye. The difficulty in cases of hysterical anesthesia is not in the anesthetic area; it is in the weakened perceptive power, which, because of its own insufficiency, can no longer accommodate or find room for or assimilate more than a limited number of impressions, to the exclusion of others. The merit of this theory is that it places the responsibility where it should justly belong, on the central organ of perception, though the symptoms are entirely peripheral, and makes the mental state responsible for the causation of a condition that might at first sight seem to rest upon some fault either in the reception or transmission of impressions. This theory is, however, inadequate in that it will not explain the loss of electrical sensibility, nor why the anesthesia should affect one lateral half of the body with such frequency.

In place of anesthesia we may have in hysteria hyperesthesia or what is known as paraesthesia. Now, it is certainly true

1 The reflexes which may be abolished are the response to tickling the soles of the feet, the palpebral reflex which causes closure of the eyes when the conjunctiva or cornea is touched, and the reflex that causes vomiting when the palate or fauces are tickled.

that hysterical patients may, like others, suffer from occasional neuralgias, depending upon causes identical with those which occasion these painful attacks in other persons. It may even be that such neuralgias become more marked at the menstrual epoch; this in no wise implies any hysterical origin. The true hysterical hyperesthesias are those which can hardly be traced to neuralgia or other causes of pain; they are, for the most part, exaltations of sensibility developed under the influence of some controlling thought or fixed idea. There is no better example of this condition than the affection which has received undue clinical importance under the heading of railway spine.

Unlike the hysterical anesthesia, the hyperesthesia is not limited to one lateral half of the body, nor does it encroach upon so large an area of the cutaneous surface. It is most likely to occupy some prominent part of the body that may have been exposed to injury, or that is so situated as to make it more liable to traumatism. The vertex of the skull, the occipital protuberance, the spinal processes, the elbow or knee-joints, the nipple or the mammary gland are favorite situations.

The hysterical character of the painful sensibility can readily be determined by engaging the patient's attention and then making palpation or pressure, or even resorting to more forcible irritation. With mental concentration upon some other subject it will frequently be found that the sensibility in the affected part is in reality lower than in the surrounding healthy portions of the skin. Let the patient but know that the examination is being made, and there is immediate alarm and great pain.

The hyperesthesia may involve not only the skin, but the deep-seated parts or glandular organs, such as the testes, ovaries, etc., and then it will happen that pressure over the painful area induces a spasm or hysterical crisis.

Motor phenomena show modifications similar to those which we find in the sensory sphere. The changes here are all in the direction of diminished activity. Voluntary movements are slowed, are performed with less energy, and lack the precision habitual to them in healthy subjects.

Perhaps the most striking of motor phenomena is the tendency to contraction shown by many of the voluntary muscles, a sort of increased irritability not unlike the tendency to spasmodic contraction and excessive reflex movements seen in organic disease of the spinal cord. This has been termed the diathesis of contraction.

Hysterical patients suffer from a curious form of ataxia, dependent upon their inability to receive more than a limited number of impressions simultaneously through the muscular sense; so that movements of any complexity can only be performed with the aid and controlling influence of the eyes, or with the guiding sensation of touch. The distinguishing feature of such ataxic movements is that they present the abnormal alteration only when a conscious effort is made to accomplish some particular object; in movements that have become automatic there is no lack of precision. When the aid of vision is required, it may be that sight will only be necessary to commence the desired movement, which, when once begun, continues without further control.

The diathesis of contractions, to which allusion has been made, shows itself by a tendency to spasmodic contractions upon very slight superficial irritation. This tendency may exist in weakened muscles; may be localized; have a general distribution; may be accompanied by exaggerated reflexes, or by a slight modification of electrical excitability. It can be developed by sudden movements of extension or contraction, by rubbing, by a breath of air blowing upon the surface, by encircling the limb by a constricting band. Like the anesthesia of the limb, it readily disappears under the influence of suggestion, somnambulism, and often during sleep.

Aside from the so-called hysterical attacks, nothing in connection with the disease is more striking than the more or less lasting paralyses and contractions. The patient recognizes the paralytic condition, while the anesthesia may escape his attention until discovered in the medical examination. Momentary conditions of paralysis or contraction may precede the hysterical attack; they are of comparatively little consequence. Paralyses or contractions which follow the attacks are apt to be more lasting, and require very prompt attention. They occur most commonly after injuries of some sort, and the amount of damage inflicted bears no re-

lation whatever to the extent or degree of the succeeding contraction or paralysis. An appreciable interval frequently occurs between the receipt of the injury and the appearance of these symptoms, an interval in which the mind becomes more and more occupied with the idea of the injury which has been done, and of the consequent helplessness likely to supervene.

Infectious diseases are sometimes followed by hysterical contractions or paralyses, the weakened physical condition being the first element in suggesting to the patient the probability of a more permanent loss of power.

Hysterical paralyses are rarely accompanied by any trophic lesions. There is no tendency to atrophy of the affected muscles, none to edema of the limb. The reflexes are not impaired; if any change is noted it is usually in the direction of exaggeration. They are in nearly every instance accompanied by disturbances of sensibility, anesthesia, or it may be hyperesthesia. They are rarely complete, in the sense that if it be hemiplegia or paraplegia which affects the individual, or if one extremity alone suffers, there is always some particular movement, or set of movements, some muscles or group of muscles, not disturbed by the apparent loss of power in other parts in the vicinity.

These paralyses are of varying duration, and show a marked tendency to reappear. The loss of power may alternate with periods of tonic contraction. Both the paralyses and the contractions may come on suddenly or slowly. The disappearance may be equally abrupt or be gradually accomplished by the treatment. In all cases the electrical reactions remain unchanged. In cases of hysterical contraction there is very marked resistance to every effort to straighten the contracted members. Indeed, it would almost seem, at times, that while under examination the rigidity increases. In contractions due to organic lesions the rigidity is not so marked, nor is the resistance to passive motion such as to interfere wholly with the manipulation. Contraction from spinal disease occurs for the most part from conditions in which the reflexes are exaggerated.

Painful conditions about the joints give rise to great perplexity in diagnosis, and may lead to marked contraction of the muscles around the articulation. There may be shortening, adduction and partial flexion, with complete immobility when the hip-joint is affected, so that the diagnosis from coxitis is by no means easy, not even when the patient has been anesthetized. The patient may be able to walk with the aid of a cane; in severe cases he is confined to his bed. In hysterical joint affections there is always an area of hyperesthesia extending for some distance beyond the joint; the joint is not in itself sensitive to pressure, so that the trochanter or knee will bear considerable force without any indication of suffering.

A singular manifestation of incomplete paralysis is furnished by that curious condition, known as astasia abasia. It is characterized by partial or complete loss of power in those muscles whose co-ordination is necessary for walking or standing; but the loss of power shows itself only in the effort to accomplish one of these movements. In any other position, as when reclining or seated, the affected muscles show themselves possessed of normal power, and obey readily all the impulses of the will. A patient may be able to run, but unable to walk or stand. Nothing could, perhaps, more clearly illustrate the predominant cerebral influence than such an association of symptoms.

Lastly, I may be permitted to allude briefly to trophic disturbances in hysteria. The possible association of the two has only been recognized in recent times. Most of these troubles take the form of cutaneous disorders. There may be pemphigus, vesicular erythema, gangrene of the skin, hemorrhage, either in the form of ecchymosis or bloody sweating; local asphyxia, or edema, either white or bluish.

The long continuance of a hysterical contraction sometimes leads to contraction of the tendons or to atrophy of muscles, limited to the limb which is the seat of the hysterical paralysis or contraction. The atrophied muscle, whether the diminution in volume has taken place slowly or rapidly, will show the normal reaction as to reflexes and to electrical tests.

These are the more important symptoms that may be, at times, thought to be in relation with spinal disease. I have not in any way entered upon their treatment, for that would involve the consideration of the whole subject of the management of hysteria. Success will be most generally found by strict adherence to the old Latin motto—*Suaviter in modo, fortiter in re.*

THE RELATION OF UTERINE DISEASES TO FUNCTIONAL AND ORGANIC OCULAR DISEASES*

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So potent is the influence of the uterus on the eye that its appendages, lids and muscles, lachrymal gland and nasal duct; its tunics, external and internal; cornea and sclerotic, retina and choroid, and its media, are said to be either functionally or organically, primarily or secondarily, affected by it. A study of these different diseases in their various and varied phases would cover a vast territory of interesting investigation. So closely are they sometimes linked that the delicate and subtle influence of the one on the other might easily escape detection. We are often baffled in our efforts to cure or relieve a disease because we do not look far enough for its remoter causes. It is certainly our duty, then, to take in all the possible and probable causes of disease, thereby adding much to the comfort of our clients as well as to our personal satisfaction.

It hardly seems reasonable that an organ so remote from the uterus as the eye should be so influenced by it, and yet there is a mass of clinical observation, made by competent observers, which shows an unquestionable connection between the two. Shall we call all these affections reflex? It would be hard to prove it. The question of the causes of optic neuritis and papillitis, for instance, is still being discussed, and many theories have been advanced. Its cause is not yet definitely settled. We have optic neuritis and papillitis in connection with uterine disease, but I shall not worry you with a discussion of the various theories, but review the question from a practical standpoint.

The menstrual function is of such great importance to the health of the woman that we may with great profit study its influence in normal as well as abnormal conditions. It seems hardly reasonable that normal healthy menstruation should disturb the eye, and yet it is true. Among these affections is a conjunctivitis, which is transient and subsides after the period has passed. It is not severe, reaches its climax after the flow is fully set in, and quietly subsides. Styes are also occasionally severe at this time. Cases of blepharitis marginalis are aggravated, and little pustules appear on the margin of the lids around the hair follicles, and the edges of the lids present a swollen and red appearance. Cohn saw one case in which there was each month a marked protrusion of the eyes, swelling of the thyroid gland and palpitation of the heart, all of which disappeared after menstruation ceased.

Contraction of the field of vision, with defective color preception, is not infrequently seen, and on this point careful observations have been made. These defects, however, do not interfere with central vision, which remains intact. The contraction begins two or three days before the catamenia, and continues until they cease. Herpes of the cornea have been observed, but they are of short duration. Asthenopia not infrequently occurs, especially in those who have some error of refraction. At this time reading is painful, and followed by headache or browache, or the glasses which at other times are comfortable enough do not now answer the purpose.

Dr. Geo. E. Jones reports a case of a young girl, aged fifteen years, in comparatively good health, who during a short time before the menstrual flow would be troubled with strabismus convergens, which would last until the flow was well established, then the recti muscles would be relaxed, leaving an aching sensation for some time. He says further: "I am never surprised at any symptom or symptoms that may be connected directly or indirectly between the organs of the pelvis and any distant portions of the body. We are constantly on the alert watching for them. In fact, it is an impossibility for the uterus and its appendages to be affected or diseased to any extent without

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the sympathetic nerve making it known to a portion, if not the whole system."

I have frequently observed that previous to the development of the menstrual function in girls from twelve to fourteen years of age that the asthenopic symptoms are very much aggravated. With the error of refraction carefully corrected, the eyes are not comfortable, nor can they be used without the glasses. Tonics and rest do not relieve them. In these I have observed a sharply defined line between discomfort and comfort as soon as the function was established. This is a point for teachers, mothers and guardians to know and consider. But in the rush which pervades teaching, as well as everything else, no allowance is made for this critical period.

M. Dor reports a case of "a girl in whom the catamenia had not yet appeared, but who had hemorrhages in each vitreous, the blood disappearing and reappearing at intervals. When menstruation at length supervened with regularity the hemorrhage and amblyopia which universally accompanied them disappeared and did not return."

Hysterical photophobia occurs not infrequently. It is characterized by symptoms which would indicate a very serious disease if we could believe the statements of the patient. There is usually a history of long confinement to the house on account of intense pain, which even one ray of light would produce. The patient finally comes with her head bundled up with numerous thicknesses of veils and wrappings of various kinds. She refuses at first to have the eyes inspected, but gradually yields if her mind is distracted by conversation concerning some topic entirely foreign to her affliction. One by one the wraps are removed, and little by little the light is let into the room, until finally she opens her eyes and finds, much to her surprise, that she can still see. Such cases have to be treated with great circumspection until you have gained the confidence of your client, and then the way to recovery is clear. Behind the photobia there is sometimes an error of refraction, which should be corrected. Anemia and constipation, together with dysmenorrhea or amenorrhea, are associated with these cases. Such symptoms as are described above occur, in my observation, more frequently in maiden women of uncertain age. The eyes, when an examination can be effected, are found normal and healthy, but the relief which they experience is none the less grateful on this account.

In October, 1893, I read a paper before the Academy of Medicine in which I described a case of hysterical photophobia in a young girl. It followed a very protracted case of keratitis, and she came to me supposing she had a return of her old trouble. I found, however, that the cornea was clear and free from inflammation. I resorted here to a radical measure, that of introducing an eye speculum between the lids, which would cause sharp pain. Two treatments relieved her completely. She had dysmenorrhea.

Gowers, in "Diseases of the Nervous System," speaking of retinal hyperesthesia, says: "Apart from occular diseases, it occurs in weak states of the nervous system, especially in women, and sometimes in association with symptoms of hysteria." these cases it is called retinal hyperesthesia, but it is not certain that the morbid disease is in the retina. The symptom was once thought to indicate inflammation of the retina, but in most of the cases the deeper parts of the eye are normal, and actual retinitis, strange to say, may cause no intolerance, nor does this ever result from simple neuritis.

Allied to hysterical photophobia is hysterical amblyopia. To the patient and her friends it is an alarming condition. It comes on suddenly and involves one and sometimes both eyes. The blindness is sometimes absolute, but again there is perception of light. The pupil is usually normal and responsive to light, and this is a valuable symptom to distinguish it from amaurosis. The ophthalmoscope reveals no alterations of the fundus. This disease occurs more frequently among young ladies who are still at school. They are often anemic and have some uterine disturbance. I have seen it where there was a suppression of menstruation from taking cold. It occurs among young ladies at boarding schools who overwork themselves and do not take enough out-door exercise. Insomnia and errors of digestion and assimilation are associated with it.

I have already reported two cases of hysterical amblyopia affecting one eye which disappeared while I was making a test of the refraction of the good eye. I sup-

posed the eyes to be amblyopic from disease, as such instances come frequently under observation. Greatly to my surprise, I found the eyes, which when the test began had only a vision 0.05, to have perfect vision.

With the anomalies of menstruation comes a long list of functional and organic diseases, in which you have all had more or less experience. Dysmenorrhea, amenorrhea and menorrhagia have peculiar ocular symptoms associated with them. So do anteflexions and retroflexions, as well as imperfect developments of the womb. With dysmenorrhea we see blepharitis ciliaris, eczema of the lids, acute transient conjunctivitis, phlyctenular conjunctivitis and keratitis. Hasner reports a case of paralysis of the oculo-motorius. There was complete paralysis of the third pair, with paralysis of accommodation, drooping of the upper lid, and dilatation of the pupil. In two or three days these symptoms all passed off. Charcot reports a case of dysmenorrhea with hysteria, where the young woman saw on the floor and wall rats, mice and cats, and fantastic animals; and another one saw mice and spiders and black stripes on the wall.

I have now under observation a young lady of twenty who suffers from painful menstruation, and has done so ever since she began to menstruate. She is unwell every three weeks; the period usually lasts a week, and she is compelled to remain in bed a day or two each time. During the last period before coming to see me she noticed a sudden failure of her right eye. I found a chorio-retinitis, involving the macula region, which caused a dense central scotoma. There was an exudation in the upper and inner field which extended over the optic disc. The entire disc was hazy, and the lower edge swollen. This amblyopia came on during the menstrual flow, and after reading for some time. I cannot tell yet what the outcome will be, but the probabilities are that if the uterine function was restored to its normal condition her eye would recover.

The sudden suppression of menstruation causes some remarkably interesting eye complications. Samelson reports a case of a young woman of twenty-one who, while working with bare feet in cold water, suffered from a suppression of menstruation. It was followed by a sensation of pressure behind the eyes. The next day there was some obscuration of vision, and in five days she was totally blind. She complained of pain in the eyes and the orbit. The ophthalmoscope showed only a slight haziness around the optic papillæ and some engorgement of the veins. She was put on active antiphlogistic treatment, and in eleven days recovered her vision again.

Coursserant details particulars of a case of which I will offer a synopsis. A woman of thirty-six, who had always been regular, was caught in a rain and returned home chilled. She had headache, nausea, vomiting and pain in her muscles. Two days later she discovered she was blind in her right eye. There was a central scotoma, and she could not see a candle fifty centimetres distant. There was a hemorrhage in the region of the macula. Two months later the hemorrhage had cleared up, but there were fine, dust-like particles in the vitreous, and five months later there was complete restoration of vision.

Galezowski reports a case of sudden suppression of menstruation from strong mental emotion in a woman twenty years of age. There was a retinal exudation covering the principal vessels and a defect in the upper field of vision.

Morren says: "It must be conceded that the sudden cessation of the physiological functions of the uterus causes a venous hyperemia, which, on its part, will bring about a stagnation of blood in remotor localities." In the same way all such conditions as parametritic exudation, retroflexion, anteflexion, descensus, prolapsus, tumors, etc., must have an analogous effect upon the pelvic organs. This is brought about through the spinal veins. He says: "It is an anatomical fact that the veins of the vertebral column are strongly developed, and communicate above with the occipital veins, and through the mastoid foramen with the transverse sinus."

This causes direct pressure on the brain, and Samelson, in the case quoted above, thinks that there was a transudation in the orbit which compressed the optic nerve, and Morren agrees with him that there was compression on the occipital lobes caused by venous stasis.

Dr. T. R. Pooley (New York), in a paper on the "Relation of Uterine Disease to Asthenopia and Other Affections of the Eye," endorses the opinion of Dr. J. B. Hunter, who says: "I have in many

cases been so accustomed to hear the eyes complained of where there was chronic uterine disease, that I believe there is no doubt as to the connection between the two ailments. In bad cases of lacerated cervix uteri, where there is much dense cicatricial tissue, patients commonly complain of weakness of the eyes, that they tire easily in reading or writing, and often ache. These symptoms I have known to disappear within a few months after operation for the cure of lacerated or indurated cervix. I have seen the same symptoms in cases of chronic retroflexion and in other affections of the uterus accompanied by congestion. The reason why I have considered the disease of the eyes sympathetic is that such disease has again and again passed away without direct treatment on curing the uterine disease."

Dr. Pooley then draws several conclusions from his investigation of his twenty cases, and says, among other things: "Asthenopia exists in cases where there is no ametropia, apparently due only to reflex effects of the uterine disturbance on the organ of vision. In other cases of asthenopia, in which ametropia is present, and the existence of uterine disease as well, the former is not always relieved by the correcting glasses."

One of the cases he refers to is that of a woman, aged thirty-four, with asthenopia, but with perfect vision, who had dysmenorrhea and hemorrhages, due to fungosities of the uterus, but when, after a curetting operation, the normal menstruation was reëstablished, the asthenopic symptoms were entirely relieved. In another case of retroflexed uterus the eye symptoms subsided as soon as that organ had been restored to its normal situation.

Finkelstein, in the Clinic for Nervous and Mental Diseases in St. Petersburg, made extensive and critical studies on the influence of epilepsy, hysteria, alcoholism and neurasthenia on the eyes. Of hysteria he says: "The fields of vision undergo a concentric contraction, and the more severe the attack the more considerable is the contraction. The fields of color vision also undergo a concentric contraction. Paracentral scotoma for green alone, or for all colors, is also met with in hysteria. A rapid exhaustibility of the retina is more noticeable in hysterical than epileptic subjects."

The study of the condition of the visual field should be made in these cases, especially where they complain of amblyopia and there is no corresponding ophthalmoscopic lesion.

A patient to whom I had recently given glasses wrote me that she had suddenly so far lost her sight that she could scarcely recognize her friends. I feared some serious trouble, but when she came, at my request, for examination, I found the fundus of both eyes sound. Her field was contracted almost to the point of fixation, and her vision reduced to $\frac{2}{200}$. She suffered from ovarian disease and from dysmenorrhea. She made an excellent recovery under rest, electricity, massage and tonics.

Morren considers episcleritis a disease frequently associated with uterine disorders. It is generally seen among females and is very chronic and rebellious to treatment and disposed to relapse. He reports a case of metritis which brought on an attack of episcleritis: "The patient was forty-five years of age. Her right eye became affected at the time she was undergoing treatment for retroflexion of the uterus, in which there was a tumor of its neck. Every time that the vaginal portion was touched or a pessary was put in her episcleritis was worse, and she had intense ciliary neuralgia. The episcleritis was cured, and remained so for about a year, when she again had uterine trouble and episcleritis occurred in her left eye, which got worse every time an application was made to the uterus."

The mechanical irritation to the prolapsed womb has been noted a number of times. Wiel describes the case of a mother of thirty-five, who had only quantitative perception of light in the right eye and ability to count figures at 7' with the left eye. There was narrowing of the field of vision, headache, tinnitus aurium and dyspnea. The uterus was so prolapsed that it rested on the perineum. After replacement and the adjustment of a pessary, and the use of iron internally, her vision began to improve. In a month she had $V=\frac{1}{12}$ in the left eye and the right eye was somewhat improved.

The period of lactation, so trying to some mothers, is associated with several ocular diseases. Catarrhal and phlyctenular conjunctivitis, as well as inflammations of the cornea, iris, and sclera, have been reported. Asthenopia is often a

symptom which lasts until lactation ceases. More serious affections of the choroid, retina and optic nerve have been reported by the best authority.

Förster in the "Handbuch der Augenheilkunde," cites a case reported by Gibbons, of a mother, twenty-five years of age, who in three successive periods of lactation suffered from amblyopia, and who, in the third one, became entirely blind. The pupils were widely dilated and fixed. Weaning the child and supporting treatment restored the lost vision.

A large number of eye complications are intimately associated with pregnancy from first to last. Among the first are asthenopia and loss of accommodation. The former shows itself in an inability to use the eyes long for any purpose. They tire easily, and any attempt to read is followed by lachrymation and injection of the eyes. Sometimes the accommodation is so impaired that convex glasses are necessary. While on this point I will say that after delivery women often try to read or sew too early. This is frequently followed by a long period of asthenopia, lasting sometimes several months. After delivery the eyes, in sympathy with the general physical condition, are unable to perform their functions in a normal condition, and care should be taken not to overtax them.

Micropsia, or seeing things smaller than natural, and hemianopsia, are symptoms which have been observed. Paresis of the ocular muscles occurs occasionally, but it is transient.

The vomiting of the early stages of pregnancy is sometimes followed by retinal or choroidal hemorrhages. Mr. Power reports a case where an extensive hemorrhage from this cause was followed by permanent impairment of vision.

You have all of you doubtless seen cases of albuminuric retinitis due to pregnancy. It comes on usually during the seventh or eighth month, but has been observed as early as the third. It is not accompanied by any pain, the only symptom being the impairment of vision. It usually is symmetrical, but exceptionally affects only one eye. Its attack is sometimes sudden owing to the hemorrhages and exudations in the macula region. The ophthalmoscopic picture which the disease presents is typical and striking, and easily recognized as such. The involvement of the retina is more or less extensive in different cases.

The question of premature delivery comes up in these cases. In the Transactions of the American Ophthalmic Society, Vol. 3, Dr. E. G. Loring, of New York, discusses the propriety of bringing on premature delivery to save the mother from impending blindness. He considers that in not a few cases it is not only justifiable, but where the true principles of sound practice demand its adoption. He instances several cases of retinitis albuminuria in pregnant women where premature delivery was resorted to with the best effects as to the mother's vision. From a moral as well as a legal standpoint he considers the operation justifiable. After induced labor the absorption of these exudations and hemorrhages into the retina begins almost at once. Little by little the blood disappears, and the outlines of the vessels and the optic disc come into view, and finally useful if not perfect vision is restored. Förster reports a case of a second pregnancy where the albuminuria came on during the last month. She had convulsions and lost all perception of light. This continued three weeks. The exudation began to absorb, and in another three weeks she could begin to see. In seven months the exudation had disappeared, the optic discs were pale but sharply defined, and the retinal vessels in the right eye remained, amaurotic, but in the left eye she regained $\frac{2}{3}$ vision.

Dr. Wadsworth (Transactions American Ophthalmic Society, vol. 4) reports a case of detachment of the retina in both eyes with albuminuria of pregnancy. She was advanced about seven and a half months when the amblyopia came on. There was very general detachment of the retina of the right eye and partial of the left, with marked impairment of vision. Her urine was blocked with albumen. She was treated for a few days with hypodermic injections of pilocarpine, under which her vision improved. Ascites developed, and it was decided to induce premature labor. The final result was favorable for the mother and child. The former recovered good vision, the detachments disappearing; and the latter, after a struggle, lived.

Not long ago I saw an interesting young married woman with atrophy of both optic nerves following parturition. There was a history of albuminuria, and when I saw her her physicial condition was excellent, but the atrophy was far advanced, with no

hope of relief from treatment. Within the past few weeks I saw a married woman, twenty-nine years of age, who had a severe chorio-retinitis coming on after delivery. There were patches of exudation in the macula region, with subretinal hemorrhages near the optic disc. At her second visit I found her better, with a prospect of regaining useful vision. It was probably albuminuric. The time for testing this point and proving it is during pregnancy. It seems to me that it would be good practice to have the urine tested occasionally during the latter months of pregnancy, so as to determine this point. Certainly all complaints of dimness of vision should be carefully looked into, and the urine examined so as to determine the condition of the retina and choroid and presence or absence of albumen.

The menopause is fraught with many dangers to the eye. This critical period of a woman's life is not passed without many dangers to health in various ways, with which an you all familiar. The eye sympathizes with the general struggle which is going on, and the chroid, iris, retina and optic nerve are not infrequently involved.

Let me give you one typical case of a woman of forty-five, who came to me with a chorio-retinitis of the right eye. She had periodical flashings of heat through her head, vertigo, headache and a general feeling of prostration. When first examined there was an extensive involvement of the macula region—a circumscribed swelling with exudations and hemorrhages. There was a dense central scotoma, which destroyed central vision. About a year later the second eye was similarly attacked. Although a very prompt and active treatment was instituted, she recovered with a large permanent central scotoma in each eye, which destroyed central vision.

Excessive loss of blood, whether from the uterus or not, is a well-known cause of blindness, either temporary or transient. In 105 cases of uterine hemorrhage collected by Fries, 24 affected vision—7 after abortion, 7 after normal labor, once each after premature delivery, profuse menstruation, uterine polypus (carcinoma), and six not specified. Gowers speaks of a case of blindness from post-partum hemorrhage associated with neuralgic pains above the eyes, which lasted several days. The patient recovered good vision in one eye and partial vision in the other, but with impairment of the field.

Dr. Engelman, in the "American System of Gynecology," in his contribution to the hystero-neuroses of the eye, refers to the statements of Rampoldi, of Pavia, who divides the uterine and ocular diseases into five groups.

1. Hysteria and chronic perimetritis, he states, are causative of asthenopia, retinal hyperesthesia, rarely of ptosis or anesthesia of the retina.

2. Menstrual disorders. He believes amenorrhea is causative of conjunctivitis, keratitis, iritis and phlyctenulæ. To suppression of menstruation he refers diseases of the choroid, together with neuritis and retinitis, and says they can only be improved after reappearance of the menses. The tendency to glaucoma is known to accompany sudden suppression.

3. Inflammatory diseases result in hyperesthesia and neuralgias of the trigeminus, protracted forms of iritis serosa and sclerosis.

4. Pregnancy causes the difficulties accompanying the albuminuria of pregnancy. Amblyopia and amaurosis have been common from three to fourteen days after hemorrhage.

5. Lactation and the puerperium cause panophthalmitis, and many diseases resulting from weakness and debility, ulceration of the cornea, retinitis, retinal hyperesthesia, photophobia and disturbances of accommodation.

Dr. Engelman adds: "I cite these diseases, which are here considered as cause and effect, but, though they may be so, certainly but few are reflex neuroses, and though Rampoldi has observed in individual cases the ophthalmic lesions in connection with pelvic affections mentioned, I do not believe that any such positive relationship of individual phases of uterine diseases to ophthalmic lesions can ever be established."

This statement is somewhat at variance with what follows, for he instances several cases where relief of the uterine disease was followed by amelioration of the ocular symptoms. One case is of especial interest. He observed upon making application of iodine to the cervix uteri that there was severe pain behind the left eye, and a sensation as if it was pushing out. This continued until the effects of the

iodine had passed off. The phenomenon was so strange that he repeated it several times with the same result, while other remedies did not affect her similarly. Here cause and effect were certainly established. He also refers to a young lady of twenty-four suffering from endometritis, cellulitis and amenorrhea, in whom an amblyopia followed amaurosis, appeared with an exacerbation of the uterine disease, but which was always improved by uterine treatment.

There seems to be some confusion as to the definition of the term uterine reflexes of the eye. Where are we to draw the line between reflexes pure and simple, which pass off, leaving no structural change behind, and pathological reflexes which show organic alterations in the ocular tunics or the optic nerve? In hysterical amblyopia we have total blindness, but no structural or organic lesion of the retina. Is this a uterine reflex? In suppression of menstruation we have retinal and choroidal hemorrhage, and sometimes permanent impairment of vision.' Is this a retinal reflex? In prolapsus uteri we have marked asthenopic symptoms and they are relieved when that organ is restored to its normal position. Is this a uterine reflex? In pregnancy we have albuminuric retinitis, and it disappears upon a natural or instrumental delivery. Shall we call it reflex? Is it only reflex when no organic lesion exists in the retina? Shall we not as justly include the other conditions also?

The observations of many competent men show that there is a recurrence of associated conditions between the uterus and the eyes which seem to follow as a *post hoc ergo propter hoc*. Engelman says that "the ophthalmic reflexes are much more persistent and yield much more slowly than those on the part of any other organ, and if they have persisted for years they are very liable to result in structural changes and disease proper of the eye." Again, he says: "In no organ is the persistent continuance of a reflex so liable to result in actual changes as in the eye."

Take, then, for example, dysmenorrhea which is associated with choroidal or retinal hemorrhage. The congestion of the choroid takes place during many menstrual periods before the hemorrhage actually occurs, but finally the vessels yield and the hemorrhage is visible with the ophthalmoscope, and vision is seriously impaired. Are the congestions which precede the hemorrhage reflex, and is the final attack, when the overtaxed vessels rupture, not reflex? Does not the law of the Stevenson wave come in here for consideration?

It is no argument to say that there are thousands of cases of uterine disease where there are no ocular symptoms. That proves nothing. All rheumatisms do not affect the heart, but some do. All exposures to the cold do not cause pneumonia, but some do. There seems to be a direct connection between the uterus and the eye in many well authenticated cases. Will you not lend your aid in clearing up the mystery which covers the relationship between them?

The ophthalmoscope can do much for the recognition of ocular disease in connection with uterine diseases. Light can be thrown on amblyopias, whether of organic or functional origin, which will be of much value to the suffering client. A differentiation between these two forms of disease can be made, and thus aid materially in a rational treatment. The relief of the asthenopias by the trial case will give much comfort by the correction of the ametropias of various kinds which are met with. Muscular errors can be corrected and the accompanying distress relieved. Doubtless the general physical condition has much to do with the associated involvement of the uterus and the eyes. With the health broken down with external and other diseases the eyes are more liable to certain affections than they otherwise would be.

The highest authorities in the ocular field of work and investigation believe in the connection between uterine diseases and diseases of the eye. May we not have co-operation of those who devote their lives to uterine work to aid us in the further prosecution of this interesting and somewhat obscure subject?

A New Sensation.

The small boy had gone out with his father for a sail and the bounding billows had shaken him up to the extent that he had parted with his breakfast.

"Oh, Papa," he exclaimed after the second attack, "what makes me unswallow that way?"

COMMUNICATIONS.

IS TOTAL EXTIRPATION OF THE RECTUM EVER JUSTIFIABLE?*

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In the title the fact is indicated that such a procedure is advised, and I may add is strongly recommended by many. With due deference to all I shall raise the question as to its justification. It can not be gainsaid that some surgical operations are done with but little to recommend them. In this age of progress in surgery, I opine that some are led into doing operations as much to test the methods of others and to put themselves in line, as to accomplish that which should be the surgeon's chief aim, viz., to relieve the patient. It can not be denied, either, that there is what might be properly called a *rage* in surgical work, and it behooves surgeons occasionally to take a breathing spell and look back over the field, if not over the dead. I admit that conservatism in surgery oftentimes may mean early and complete operations, but it must be admitted that he is the best surgeon who has studied well his subject from all standpoints and is ready for any emergency. To operate or not to operate, is often the question, and much rests on the decision. If the eager, ambitious, aspiring young surgeon could have in his time of need the advice of his cooler-headed elder brother who has met with many a danger, what a blessing! We, in this country, are much given to copying our European brethren, even to their vagaries, in both medicine and surgery. New instruments, new operations, new books, new everything, is the cry with us, and we don't stop to think whether the new is any improvement over the old or not. Oftentimes the *original* operation is far preferable to the so-called modification of the same.

With these remarks as a preface, I desire to call attention to the question propounded. "Is total extirpation of the rectum ever justifiable?" There are two propositions I submit against the advisability of the total extirpation of the rectum for any cause:

1. Is the patient ever cured of the trouble operated for, by said operation?

2. Is the patient ever materially benefited or relieved by the operation?

I take it for granted that the only cause for which it could be said that total extirpation of the rectum should be practiced, is malignancy. I use the term here as synonymous with cancer. We note, then, the characteristic features of malignancy as: the disposition to grow, to ulcerate, to infiltrate and to propagate. It is an aphorism well known in surgery, in cases of cancer, "operate early if you desire success." All teachers, too, know how assiduously they urge a *thorough* operation whenever dealing with this character of tumor." For instance, when removing malignant growths of the breast, how important it is to remove the glands in the axilla also. Again, how insidiously does a malignant tumor invade the system and establish a cachexia. How difficult to tell the dividing line between a local condition and a general infection. Add to this the suspicion always that the tumor has propagated.

These questions are difficult of solution, even when the growth is situated in or upon the external parts. How much more difficult when located in an obscure part of the anatomy as is the rectum. Cancers found here are so stealthy in their growth and invasion of tissue that oftentimes the whole rectum is blocked by the mass while only symptoms of constipation and some reflex pain are complained of. The tissues surrounding this portion of the gut are soft and easy of invasion; the blood circulation is great and the lymphatics are freely distributed. The contiguous parts are vital ones; the bladder, the peritoneum, the prostate gland, the

*Abstract of paper read in the Section on Surgery and Anatomy, American Medical Association, 1895.

*Professor of Surgery, Kentucky School of Medicine, etc.

vagina in the female, are all easy of invasion. By the time that a growth in the rectum has assumed sufficient proportions to be diagnosticated as cancer, many of these parts are already invaded by the process of infiltration. To dissect and draw down the rectum in the normal state may be comparatively an easy matter, but to completely dissect out a rectum that is so pathologically changed as in a cancerous growth, is nearly a physical impossibility. Beside the difficulty of accomplishing its free dissection, it is one of the bloodiest operations that I have ever attempted.

Admit that it can be successfully done, I would ask what amount of good accrues to the patient? Infiltration is clearly proved by the amount of adhesion that is witnessed. Can we, now, "cut wide of the mark?" I believe that every surgeon will concur in the opinion that to make the operation complete, all glands in the inguinal region should be removed. But what about the infiltrated tissue left in and around the rectum? It does not require very much dissection to draw down the natural gut. Sever its connection at the anus, and it can be pulled down. But it requires a long, tedious, and free dissection to remove the cancerous rectum. What shall we do with the injunction to "cut wide of the mark?" It can not be done without invading with the knife the vital parts mentioned. Nay, not then. Then of what use is the operation? A bloody procedure, rectum gone, and infiltrated tissue left. Would any sensible surgeon dissect out a cancer in the breast and cover the wound with infiltrated flaps? Why, then, should a surgeon dissect out a cancer of the rectum and leave infiltrated tissue? How can he prevent it, or how is he to know that infiltration into the adjacent tissues has not taken place?

It is nearly self-evident from the clinical history of all these cases and from the pathologic changes, that such condition does exist. A cancer of the rectum in its incipiency is very difficult to detect, and is rarely seen by the surgeon in this stage. If it invades the anal orifice first, this rule does not hold good, but no surgeon is likely to remove the entire rectum for a growth at the anus. It must be admitted that it is in the incipient stage of cancer that an operation would be most justifiable. And yet for a nodule along the course of the rectum, any surgeon would hesitate about removing the whole rectum. Then if it is not justifiable to totally extirpate the rectum for a circumscribed or incipient condition of cancer, is it justifiable to remove the same after adhesions, infiltration and a cachexia has been established. When, I would ask, is total extirpation of the rectum justifiable?

All malignant growths affecting the anus first should be removed, if seen at the the proper time. If a growth of this kind is situated in the immovable portion of the rectum, and has not extended higher than this, or has not invaded vital strucures, the surgeon can remove it, observing the injunction to "cut wide of the mark." But this is a very different thing from removing the entire rectum and that, too, when no promise can be given.

I have written after a fair trial of all methods proposed for the total extirpation of the rectum. But as I have usually seen these patients go on from bad to worse, I must confess that some remorse of conscience has overtaken me when the question stared me in the face, why did I do so formidable an operation, when in truth there was no good surgical reason for doing it. This is an unfortunate class of patients, the most unfortunate of all, and they do indeed catch at straws. They need our fullest sympathy, and nothing less than a firm conviction that we can either cure or materially benefit them, should lead the surgeon to do so radical an operation as the total extirpation of the rectum. Can we promise either?

CORRESPONDENCE.

CHRISTIAN SCIENCE—REPORT OF A CASE.

Editor of MEDICAL AND SURGICAL REPORTER:—Within the past few months I have noticed several articles on the so-called Christian science craze, published in the MEDICAL AND SURGICAL REPORTER, and as I have had one case in which I came in

contact with some of the most ardent believers in that system, I will report it.

Why the system is called christian science we have not far to look for an explanation. The devotees and adepts of the system believe that the spirit of Christ still lives and has control over the diseases of the living, and that if He is properly asked in good faith to cure any given case He will do it without any administration of medicine by physicians. These people are sincere in this belief however unreasonable it may appear to others.

I cannot see why there could not be just as effectually a Gantama Buddha-science, a Mohammedan-science, a George Washington-science, a Confuscian-science, a Morman-science, or an Ann Lee-science. If I had a case of ovarian disease and were to trust it to the spirit of any dead man, I think I should prefer a McDonell-science, or Peaslee-science, or some of those pioneers in that department of gynaccology, than to any of those religionists who did not understand anatomy or pathology, when on earth. I shall put my trust in the advancement of science and education, where, every time, will be found reason, common-sense and truth. So strong is the faith and trust of the christian scientists that they will treat themselves and their duped friends and patients, even to the point of death, without consulting a physician. There are many cases that will recover without medicine, and such cases in the hands of christian scientists gain points for their system.

I will report a case that was a hard one for them to gain a point. Thomas—, aged about 16 years, while working with a chain in an ice-house, got two fingers caught in the links, tearing off most of the flesh from the two last joints. He wrapped a handkerchief around the fingers and started for the doctor's office. His parents were soon at the office. They were both strong believers in christian science, but this case was a little too much for them to cope with. However, the mother, having rather the more faith of the two, endeavored to substitute prayer for the surgeon's case. The fingers were bleeding profusely, and were exceedingly painful. The mother took him into a room alone and tried for one whole hour to persuade him that the fingers were not bleeding, not painful and that it would not be necessary for the doctor to dress them. The young man stood it rather impatiently, and at the end of the hour he would endure it no longer, but called us in to dress the fingers. The mother objected to the administration of an anesthetic, but yielded to her son's wishes when we informed her that we did not care to give him an anesthetic, as we could amputate the fingers just as well without.

The anæsthetic was administered and the fingers properly dressed in much less time than it took the mother to go through with her useless incantations.

After the treatment was completed the mother, being a very *tonguey* woman, delivered an *address* in favor of Christian science, berating with strong invectives the medical profession. I told her at once that if she or any of her associates would cause Thomas fingers to grow out full length and be of as good shape as they were before the injury, I not only would *take stock* in the system, but would practice it exclusively the remainder of my life. She was indignant and replied that if we could have faith enough, it would not be more than twenty years before it could be done! I inquired, if it took her profession twenty years to grow out amputated fingers, how much time would it be necessary for her to take the ends of Tom's fingers and grow another Tom back of them? There were no bounds to her indignation.

If that process could be made successful what an improvement it would be over the *old method* of raising and multiplying children! All we should have to do to raise a large family of children would be to select some good child, chop off the fingers and set them to *sprouting* under the direction of some Christian science adept. No more sore nipples; no more eclampsia, and no more ruptured perinei; no fears of conception.

Well, I awake from this dream. There is no use to try to instill the light of science, or reason, or even common sense into these wild fanatics. They will heed no reasoning, but pursue their accustomed channels of thought. Their insanity is incurable; we never hear of a recovery; they are past help when once started on that line, although rational on all other points.

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SATURDAY, AUGUST 10, 1895.

EDITORIAL.

"A MEDICAL STUDY OF THE JURY SYSTEM."

Dr. Crothers, in the *Popular Science Monthly*, says: The uncertainty of jurors, and the capricious, whimsical character of their verdicts, are accepted as inevitable and explained as part of the natural weakness of the mind. It is assumed that, if the facts are clearly presented, a jury will give a common-sense verdict which will approximate the truth and human justice. Where they fail, it is due to the confusion of testimony, the misrepresentation of counsel, and the general perversion of facts. Many thoughtful men consider the judgment of twelve men, who are disinterested, superior and on general matters of dispute of far more reliable character than the judgment of one trained man. Yet literally, the verdicts of twelve men, based on the same set of facts, differ widely, and can never be anticipated; and, whether wise or unwise, are clearly due to other influences than the commonly supposed conflict of facts and motives of truth and justice.

While it would be difficult to doubt the motive and intent of the average juror to be just and fair in his conclusions, it would seem that certain conditions and surroundings make it impossible in most cases to either understand the case in question or the principles of equity involved. From a medical and scientific point of view, the average twelve men who are appealed to by the counsel and judge to wisely determine the issue of a case are usually incompetent naturally, and are generally placed in the worst possible conditions and surroundings to exercise even average common sense in any disputed case.

In a noted trial at Hartford, Conn., out of a panel of 100 jurors, twelve men were finally selected after a long, searching inquiry. Five of them were farmers, who worked hard every day in the open air, men who were unaccustomed to think or reason, except in a narrow way along their surroundings and line of work. These

men all swore that they had not read any details of the case, although it occupied a large share of public attention and had been discussed freely in all the papers. They were muscle workers, with but little mental exercise, living on coarse, healthful food, and sleeping from early evening to early morning. Of the rest of the jury, one was a blacksmith and two were mechanics, all steady workers; one was a horse trader, one a groceryman, one a retired farmer and trader, and the last man was an ex-railroad man who had no business. Every one of this jury was accustomed to be in the open air, and had not read details of the case, although he had heard it talked over. Not one of these men would have been chosen to take charge of any trust, or to decide on any matter outside of his everyday life—simply because, on general principles and from common-sense observation, he would have been considered clearly incompetent. For ten days this jury was confined from five to six hours a day, listening to the testimony of the mental capacity and motives of the maker of a will that was disputed. Of course, they disagreed; and had they reached a unanimous verdict, its wisdom and justice would have been a matter of accident.

In a noted murder trial at Portland, Me., it was evident that the jury had been impressed favorably to the prisoner. The prosecuting attorney suggested to the sheriff that he invite the jury to church Sunday evening to hear a noted preacher. The topic of the clergyman was "God's Hatred of Sin, and DIVINE JUDGMENT." The attorney knew the topic and the intense dogmatism of the preacher, and calculated its effect on the jury. A verdict of conviction followed, due almost entirely to the sermon. The personal characteristics of the jury are often the only doors through which they can be influenced. Religious, political, and social or personal prejudices are often considered by counsel in the presentation of the evidence. In reality, the average juryman becomes more incapacitated to rise above his prejudices, or to reason impartially, every day he is confined to the court room. At the end of a long trial he is utterly unable to form any new views, and nothing remains but his old prejudices, and these are often more fixed than ever.

The following record of a juryman's experience was made by a carpenter of more than average intelligence. He put down each night his impressions: The first day he was impressed with the magnitude of the case and the sadness of the prisoner. He did not sleep the first night, for the reason that four men occupied one room. The air was bad, and two men snored loudly. The second day he tried to remember all that the witnesses said, and its bearing on the case, and at night was very weary and went to bed early, but was wakened and disturbed by the other jurors. The third day his head ached, and he could with difficulty follow the testimony. His appetite was poor and he was drowsy. The fourth day he was astonished to hear opposing evidence; statements which had been made by apparently honest men were affirmed to be false. He was shocked, and his first impressions and personal interest were disturbed. His head ached, and he felt weak and nervous; his appetite and sleep were broken. The fifth day he gave up all efforts to follow the testimony, or to understand what was said. He felt stupid and excessively tired. The other jurors began to complain of the food and the sleeping rooms, and had several quarrels with each other on religious and political matters. Foolish stories were told, and card-playing and personal boasting filled up the evenings. They all manifested disgust at the trial, and longed for the end, and declared they would never be caught in a similar case. On the sixth day the case was closed. The arguments of attorneys and

the judge's charge seemed very dull and wearisome. He felt sick, looked forward to a release, and his interest in the case had died out. He could not understand why so much was said that was contradictory, and why the judge should not tell them the real facts of the case. In the jury room no discussion took place; each one voted "guilty" or "not guilty;" and when they found the majority was "guilty," most of them followed the majority. Two of the minority became angry, and refused to vote for over a day, except in favor of the prisoner. They gave no reasons for their belief, only saying that they were right and the rest of the jury were wrong. Finally, one of these men was accused of having some personal object in voting for the prisoner, and after a short altercation he changed, and the other man followed him, and the verdict "guilty" was agreed upon.

ABSTRACTS.

SYNOPSIS OF FATAL CASES OF TYPHOID FEVER IN THE PENNSYLVANIA HOSPITAL DURING THE YEAR ENDING, FIFTH MONTH, 1st, 1895.

I. J. F. Admitted fourth month, second, 1894. Male, white, Norwegian, sailor, aged 28. Brought to hospital from steamer. On admission was found to have croupous pneumonia of the right base which had begun five days previously. Was in very bad condition; temperature 105°; pneumonia terminated by lysis nine days after admission. Developed milk leg (right). Twenty-three days after coming into hospital his temperature again began to rise and a number of rose-colored spots —disappearing on pressure—appeared on the abdomen, and the spleen became much enlarged. Died eight days after rose-colored spots were first noticed. Temperature during these eight days ranged about 104° and 105° with brief falls due to baths or sponges.

Autopsy disclosed a generalized peritonitis with much deposition of lymph. Appendix vermiformis showed marked inflammation of its mucous membrane with several small ulcers. There were two or three large ulcers in Peyer's patches. Colon much distended with yellow fecal material, with numerous points of ulceration throughout its whole extent.

II. L. Q. Admitted fourth month, 12th, 1894. Female, white, American, housewife, aged 21 years. Admitted on the eighth day of the disease. Very sick on admission; temperature ranged about 103° and 104°—not much affected by baths, attaining high level one hour after bath was given; had very obstinate vomiting and diarrhœa. Twenty-three days after admission temperature reached normal by lysis and remained down for seven days when it began to gradually ascend without discoverable cause—remained slightly elevated until her death thirteen days later, which was apparently due to exhaustion. Had to be fed by nutritive enemata for some days previous to death.

III. T. C. Admitted fourth month, 24th, 1894. Male, white, English, driver, aged 19 years. Admitted on the ninth day of the disease. Died six days after coming to hospital; temperature ranged about 103° and 104°. Was reduced a degree or so by baths, but in an hour would have attained the same or in some instances a higher elevation.

IV. F. M. Admitted sixth month, 9th, 1894. Male, white, German, aged 31 years. Came in on the eighth day of the disease; delirious and very weak on admission. Died four days later.

V. W. R. Admitted seventh month, 14th, 1894. Male, white, American, aged 21 years. Admitted on the eighth day of the disease; condition so bad that he could not be bathed; abdomen greatly distended

from time of admission. Was sponged and guiacol was tried for the reduction of temperature. Died seven days after admission.

VI. C. P. Admitted seventh month, 20th, 1894. Male, white, German, aged 25 years. Admitted on the fifteenth day of the disease. Had a very high range of temperature and several very profuse hæmorrhages from the bowels. Died seven days after admission.

VII. C. C. Admitted seventh month, 29th, 1894. Female, white, Irish, aged 29 years, housewife. Came to the hospital on the eighth day of the disease; temperature persistently high, 104° and 105°. Stood baths so poorly that their use had to be abandoned. They did not effect much reduction of temperature. Died eight days after admission.

VIII. E. G. Admitted seventh month, 31st, 1894. Female, white, American, aged 18 years, housewife. Came in on the eleventh day of the disease. The day after admission she became wildly delirious with symptoms of meningitis. Died ten days after admission. *Autopsy* revealed many deeply excavated ulcers about the lower part of the ileum. Membranes of brain and upper portion of cord showed evidences of recent inflammation.

IX. H. M. Admitted eighth month, 10th, 1894. Female, white, Scottish, aged 18 years, housewife. Came in on the third week of the disease. Had an abortion on the fourth day after admission. Died on the fifth day after admission.

X. M. M. Admitted eighth month, 11th, 1894. Male, white, Dane, aged 29, waiter. Came in on the sixth day of the disease. On admission he had systolic murmurs at the pulmonary, mitral and aortic orifices. It was impossible to determine whether they were functional or organic during life. He was delirious when brought to hospital and died eight days after admission. At *autopsy* many typical typhoid ulcers were found. The heart was large, flabby, very deeply stained, otherwise negative.

XI. D. D. Admitted eighth month, 11th, 1894. Male, white, Italian, age unknown. No history of illness obtainable. Had croupous pneumonia of both bases on admission. Died thirteen days after coming in. *Autopsy* revealed typical typhoid ulcers.

XII. A. J. Admitted eighth month, 26th, 1894. Male, white, English, age unknown. Had been sick one week previous to admission. When brought to hospital was delirious and very weak. Died two days after admission.

XIII. J. S. Admitted eighth month, 27th, 1894. Male, white, Italian, aged 15 years. Came to hospital in third week of disease. Was delirious and very sick. Died two days after admission.

XIV. F. W. Admitted eighth month, 28th, 1894. Male, white, Irish, aged 23 years; sailor. Patient removed from his ship on which he had been sick several weeks without any medical attendance. Was stuporous when admitted with symptoms of empyema. Died seven days after admission.

Autopsy revealed large collection of pus in right pleural cavity, and many typical typhoid ulcers in ileum.

XV. M. K. Admitted ninth month, 10th, 1894. Male, white, German, aged 23 years. Came in during fourth week. Wildly delirious and very weak on admission. Died four days after admision.

XVI. E. D. Admitted eleventh month, 28th, 1894. Male, white, American, aged 23 years. Came in in the third week of the disease. Was very sick and weak on admission. Died fifteen days after coming to the hospital. Had a number of very profuse hæmorrhages during the week preceding his death.

XVII. E. A. Admitted second month, 4th, 1895. Female, white, American, aged 43 years; nurse. Came in in third week. Had been delirious for one week previous. Died two days after admission. *Autopsy* revealed many typical typhoid ulcers in ileum.

XVIII. P. D. Admitted fourth month, 1st, 1895. Male, white, Italian, age unknown. Came in on the thirteenth day of the disease. Was in very bad condition with much hebitude. Died six days after admission. *Autopsy* revealed many typhoid ulcers in Peyer's patches.

XIX. T. W. Admitted fourth month, 5th, 1895. Male, white, American, aged 33 years. Had been sick for one week before coming to hospital. Had croupous pneumonia of right lung and was very delirious. Many blood casts in urine. Died seven days after admission. *Autopsy* revealed many typhoid ulcers in ileum, croupous pneumonia of right lung, and hæmorrhagic nephritis.

Cases I and XIV were removed from ships, each suffering a severe illness; one pneumonia, the other empyema. Both had been in unhygienic surroundings, and had lacked proper care.

Case IX had an abortion on the fourth day after admission.

Case XI had croupous pneumonia, the symptoms being so severe as to mask those of typhoid.

Case XII died two days after admission.

Case XV came to the hospital in the fourth week and died four days after admission.

Case XVII was admitted in the third week and died in two days.

SOCIETY REPORTS.

OBSETRICAL SOCIETY OF CINCINNATI.

Dr. Joseph Eichberg read a paper on

SPINAL SYMPTOMS IN RELATION WITH HYSTERIA.

DISCUSSION.

I have often been puzzled as to these hysterical attacks, whether they were cerebral or spinal. The general definition is that in cerebral attacks there is complete abolition of intelligence, and when they are spinal or atonic the mind is not affected at all. We have a mixed condition in hysteria that is very mystifying. I do not think anybody ever studied the condition of hysteria without recognizing this, especially in the convulsions of hysteria. There is a peculiar expression, a twinkling about the eye, that indicates to you there is conciousness there. But when the patient becomes conscious and you make inquiries as to what she knows, you will find she knows nothing about it. There is complete abolition of her intelligence. The explanations I have heard to-night of hyperesthesias and anesthesia I have never observed before, and they are new to me. They certainly commend themselves to me, and sound very much like truth, and in many of these cases I have no doubt but the explanations of anesthesia that have been given will be satisfactory, and that the difficulty is really in the brain. It is centric, not as a result of disease, as I understand it, but as a result of organization. As I said, I cannot discuss this question, but I think I have appreciated the paper, and have certainly enjoyed it very much.

Dr. C. D. Palmer: If the question was propounded to-night, what is hysteria? and answered by the members of this society, no two persons would give the same answer; and if every member here were to discuss the subject of hysteria, every one would write a different paper. If I were to define hysteria, I would say it was a nervous disease dependent often upon pelvic affection, independent often of pelvic affection, which there is a disordered mind and perverted function. I think one of the chief points of Dr. Eichberg's paper is dwelling on the psychotic conditions in this disease. We all recognize the fact that the disordered mind has more to do in the disease than the condition of the body. We who treat pelvic diseases often observe hyperesthesia of the abdominal wall. Sometimes we are called upon to make several visits to discover the difference between the hyperesthesia of the abdominal wall and the inflammatory tenderness beneath the wall.

If we can distract the mind of the patient we can very often elucidate the whole question. Very often we see hyperesthesia in one of the lower limbs, and very often of the spinal cord, the so-called "spinal irritation," which is largely a myth. What is spinal irritation? One man gives one definition and another man gives another definition. Perhaps Dr. William H. Hammond has written one of the largest monographs ever published on the subject of spinal irritation, and he takes the view that spinal irritation is an anemic condition of the cord, which gives rise to the manifestations. I think that physicians generally do not endorse the

views he has advanced. But some things he has advanced are very plausible. All these cases are more or less benefited by iron, in conjunction with from remedies. The galvanic current is perhaps best utilized in the way which seems to increase the spinal circulation and overcome the spinal anemia. Spinal irritation is a disease which is often itself reflected from the pelvis.

DR. EICHBERG: The first speaker alluded to the differentiation between cerebral and spinal attacks. Of course those were beyond the scope of the paper, as it was intended to deal only with things which could be confused with diseases of spinal origin. The evidence generally speaks for itself. The cerebral manifestations are usually such as not to leave doubt for a moment as to whether they are cerebral or spinal. The difficulty in the cases of hyperesthesia which will probably be more frequently encountered than any other is the recognition of areas of anæsthesia, possibly the tracing to influences which may have an effect upon the case, as age, sex, perhaps mostly shock or injury. The mere examination of the pelvic organs will itself suffice to show there is no reason there for the manifestations that may be present. One thing is the disparity between the symptoms and the amount of damage which may be encountered in a thorough review of the case. The reflex is a point I would especially emphasize. It is of the utmost value, because the differentiation between organic and functional disease oftentimes rests alone upon the study of the reflex. The absence of the reflex would speak for organic disease. Hysterical manifestations are usually accompanied by no loss of reflex at all.

Novel Treatment for Acute Alcoholism.

A young wife had just settled in her new home. All seemed fair and promising, but one night her husband came home very late and staggered into the house. His wife was greatly shocked, told him he was ill and to lie down at one. He did so, His face was reddish-purple, his breathing heavy, and altogether he was a pitable-looking object. Mustard plasters were applied to his hands and feet. When the doctor came, felt his pulse, examined him and found that he was drunk, he said:

"He will be all right in the morning."

But the wife insisted that he was very ill and severe remedies must be used.

"You must shave his head and apply blisters," she urged, "or I shall send for some one who will."

His head was accordingly shaved closely and blisters applied. All night he lay in a drunken sleep, notwithstanding the blisters.

About daylight he awoke to a most uncomfortable consciousness of blistered agonies.

"What does this mean?" he said, putting his hand to his bandaged head.

"Lie still—you mustn't stir," said the wife; "you have been very ill."

"I'm not ill."

"Oh, yes, you are; you have brain fever. We have worked hard with you all night."

"I should think you had," groaned the victim. "What's the matter with my feet?"

"They are blistered."

"I'm better now. Take off the blisters; do," he pleaded piteously

He was most uncomfortable; his head covered with sores and his hands and feet still worse.

"My dear," he said, groaning, "if I ever should get sick in this way again, do not be alarmed or send for the doctor, and, above all, do not blister me again."

"Oh, indeed, I will. All that saved you was the blisters, and if you should have another spell, I should be more frightened than ever, for the tendency, I am sure, is to apoplexy, and from the next attack you would be likely to die, unless there were the severest measures used."

From that day he has not had another attack of drink.—(*Dover's Journal*)

Beclere presented to the Medical Society of the Hopitals, Paris, a patient illustrating the cure of myxœdema by thyroid therapy. During the course of her treatment she accidentally took a large quantity of tyroid gland—92 grains in eleven days. At the end of this time she had developed such symptoms as tachycardia, pyrexia, insomnia, tremor of the extremities, exophthalmia, polyuria, albuminuria and glycosuria; in fact, a complete picture of Basedow's disease. The writer, therefore, concludes that the latter disease is due to a hypersecretion of the thyroid gland, which may be caused in more ways than one.

CURRENT LITERATURE REVIEWED.

IN CHARGE OF ELLISTON J. MORRIS, M.D., AND SAMUEL M. WILSON, M.D.

JOURNAL OF CUTANEOUS AND GENITO-URINARY DISEASES.

Dr. Eugene Fuller describes

Six Successful and Successive Cases of Prostatectomy.

In elderly men suffering from prostatic hypertrophy there comes a time when a catheter can be introduced with great difficulty, and it is then that the question of operation is discussed.

Prostatectomy has been avoided mainly because of the large mortality from it heretofore, and castration latterly has been preferred. Except in comparatively soft prostates the author questions whether very great involution follows castration and prefers to enucleate the prostate by a suprapubic incision followed by an incision with serrated scissors through the neck of the bladder. The latter incision is about an inch or an inch and one half long, and the author prefers enucleating in this way to that through a large perineal incision. After the prostate is removed a perineal incision for drainage is made and a catheter, about number twenty-six, inserted through it into the bladder. A drainage hole is also inserted in the suprapubic opening and the rest of the opening closed by deep and also superficial sutures. Men even as old as these usually are, dislike to lose their testicles and this fact together with the operation leading to radical cure cause the author to advocate it. Six successive successful cases, several of which were emergency operations, are reported at length.

Dr. Fred C. Valentine writes of the

Treatment of Gonorrhœa with Potassium Permanganate.

The treatment is that employed by Janet of Paris. A glass irrigator is filled with a warm solution of one to six thousand potassium permanganate in water. This is raised by a pulley and when at a higth giving a moderate stream the glans, prepuce, etc. are thoroughly washed by means of rubber tubing fitted with a glass tip. The meatus and anterior urethra are then washed out, after which the nozzle is again introduced into the meatus and the patient directed to breath deeply and attempt to urinate. By slowly raising the reservoir the muscular resistance is gradually overcome and from two hundred to five hundred grammes of the solution forced into the bladder. When this viscus is supposed to be full the tube is removed to allow the liquid to be ejected. These injections are made from two to four times on the first day and twice on the succeeding days until the fourth or fifth, when the gonococci have usually disappeared. After this, injections are made once daily until the discharge disappears, which the author claims will be on the tenth or twelfth day, if not earlier. After this result it is advised to use a two per cent. solution of nitrate of silver once weekly for a week or two, and if the resulting discharge contains gonococci treat it as before—if not it will disappear without treatment. Freedom from danger of any kind is claimed for this method excepting occasionally edema of the penis.

UNIVERSITY MEDICAL MAGAZINE.

Dr. J. William White writes of

Operative Treatment of Fracture of the Patella.

The author has used Malgaigne's hooks and other methods of treatment with success but prefers the operation of Barker, thinking it safe, rapidly performed, and giving good results. The patella steadied by the surgeon's fingers and an incision made in the median line at the lower edge. Through this a strong pedicle needle is passed behind both fragments to the upper edge. The skin is stretched upward and incision made to the point of the needle which is then threaded with an aseptic silk thread and withdrawn. The needle is again introduced unthreaded at the lower cutaneous opening, passed this time in front of the patella, threaded at the upper opening with the same thread and after being withdrawn at the lower incision the thread is tied and the wounds closed. Before tying the ligatures the fragments are rubbed against each other to displace blood clots or any of the tissues that may have slipped between them. A figure of eight bandage is applied with a posterior splint and removed in about ten days. At this time passive motion is made and a light plaster bandage applied.

Dr. De Forest Willard and James I. Johnston report a

Case of Cephalic Tetanus with Recovery.

The title is applied to cases of unilateral facial paralysis associated with tetanus and due to injury to part of one of the cranial nerves. The disease is a rare one, the patient reported being the only living American case on record.

A boy of twelve years while at play was struck by a small dirty stick, possibly soiled with manure, and had the skin near the inner canthus of his right eye lid slightly torn. The wound was dressed twice and then a week later the boy was found to have paralysis of the facial nerve of the right side of the face, with trismus and a spastic gait. The boy was unable to whistle or to open his jaw.

The symptoms became more marked and a tendency to opisthotonos increased. The position of the cicatrix made it impossible to

excise it without subsequent eversion of the eyelids, so a tenotome was slipped under it to loosen it from the underlying tissues. This led to decided improvement, probably by dividing the nerve filaments.

The patient was kept in a dark room at a temperature of 72°, and guarded from draughts, noises, etc. The diet was milk exclusively. The bowels were kept open with calomel and salines, and bromides, chloral, and opium were given in increasing doses until seventy-five grains of bromide, thirty of chloral, and thirty-six drops of deodorized tincture of opium were given daily, and maintained for four or five weeks. During convalescence milk punches containing two drachms of whiskey were given three times daily.

An attempt was made to use tetanus antitoxin but none could be obtained.

PERISCOPE.

IN CHARGE OF WM. E. PARKE, A.M., M.D.

THERAPEUTICS.

The Dangers of Antitoxin.

What seems to us the strongest argument yet brought against the employment of antitoxin as a specific for diphtheria, is conveyed as follows in a recent communication to the *Medical Journal*, by Dr. Samuel Treat Armstrong:

Those that heard Dr. Winters' very comprehensive criticism of the value of antitoxin serum in diphtheria, at the meeting of the Academy of Medicine on the 4th inst., cannot but feel that an important factor has been overlooked in the consideration of the treatment with this substance; and that factor is the globulicidal power of alien serum on the blood of an animal into which it is injected.

In a monograph on Transfusion of the Blood, published in 1875, L Landois reported that the serum of the dog, the horse or the rabbit, dissolved the red globules of other animals with great rapidity. And in the last edition of Professor Stirling's translation of Ladois's Physiology, there is the statement that, if the serum of one animal is transfused into an animal of another species, the blood corpuscles of the recipient are dissolved, and if there is a general dissolution of the corpuscles death may occur.

Dr. G. Daremberg (*Arch. de Med. Exp.*, 1892) stated that his experiments showed that, while the serum of an animal of one species did not destroy the red corpuscles of an animal of the same species, it rapidly destroyed the corpuscles of an animal of another species. If warmed to from 122° to 140° F., or exposed to the light for several days, the serum lost this globulicidal power.

G. Haymen, in his monograph on the blood, states that the serum of the ox more or less profoundly changes the blood of the dog, producing in it small emboli that may involve the functions of organs or even life itself. Microscopically, these emboli consist of degenerated elements of the blood, the hemotoblasts and the red and white corpuscles being altered by the serum. He specifically states that horse's serum produces phenomena similar to those caused by ox's serum. He further states that the urine is habitually suppressed and the kidneys are congested.

The tendency of alien serum to produce emboli has also been noted by C. Lazet (*La France Med.* 1891), who found that if the serum of a dog was mixed with the blood of a man, or *vice versa*, there were produced more or less pronounced alterations, and solid concretions were formed from the metamorphosed elements.

The author believes that it was this tendency of alien serum to form emboli, that caused the death of the seventeen-year-old girl in Brooklyn. And this toxic influence of serum *per se* explains all the unusual and untoward phenomena that have been reported in diphtheria patients treated by antitoxin serum. The post-mortem lesions found in the five-year-old child whose clinical history is reported in the *British Medical Journal* for March 30th, correspond throughout with those observed by Haymen in dogs that died from the effects of alien serum injections, though the animals were given forty times as much serum as the human being.

Empiricism that has bacteriology as its sole foundation is as condemnable as any other form of that cult, and as prognosis is not yet a lost art, it seems absurd that the medical profession should accept the dictum that all persons whose nasal or faucial secretions contain the Klebs-Loeffler bacilli, should be injected with antitoxin serum. There are many recorded instances in which the bacilli have been found in the secretions of healthy individuals, and there are some recorded instances in which these bacilli have not been found in patients who clinically presented the phenomena of the disease, even to the secondary paralysis.

While antitoxin serum probably has a field of usefulness, it is evident that nice discrimination is necessary to designate wherein it lies.—*Med. Times.*

Antistreptococcic Serum.

According to a brief editorial paper in the *Revue de Chirurgie* of May, it seems very probable, from recent observations, that a

serum has been prepared which is capable of arresting the numerous forms of infection caused by streptococci. About three years ago it was shown by Roger that cultures of streptococci contain two antagonistic substances, one of which diminishes whilst the other increases the resistance of inoculated animals. The former is destroyed by heat, so that with a culture raised to a temperature of 230° F. animals can be vaccinated against streptococcic infection. The serum of animals thus treated acquires the property, not of destroying, but of attenuating the microbes which are introduced into them, and of checking the infection set up by virulent cultures. Serum taken from a mule, which had been extensively injected with sterilized cultures, was used on a woman suffering from puerperal fever. After unsuccessful injections of 8 and 16 c.cm., a third injection of 25 c.cm. on the third day was followed by defervescence of the fever and rapid recovery. Three other cases have since been published by Charrin and Roger (Societe de Biologie, March 30, 1895). The first of these was also one of puerperal fever. Injections of serum amounting to 40 c.cm. were followed after the third day by speedy defervescence and cure. An infant, 21 days old, suffering from erysipelas of the face, recovered after a single injection of 5 c.cm. of serum. In the third case which was one of streptococcic pseudomembranous angina with very serious cardiac symptoms and a temperature above 104° F., a single injection of serum was followed by recovery in the course of thirty-six hours. The author of the paper, though unwilling to draw any definite conclusions from this small number of cases, is hopeful of future success from commencing the treatment early and introducing large quantities of serum. The prospects of success in this direction are favored by the fact that Marmorek, another and independent investigator, has recently recorded a series of 45 cases of erysipelas in which the patients rapidly recovered after the injection of a specially prepared serum.—*Brit. Med. Jour.*

Sterility of Serum.

Nocard (*Sem. Med.*) noticing that blood serum taken with aseptic precautions and kept free from contamination sometimes becomes modified, found that this chiefly occurs if the serum is taken after a meal. He investigated the question, and found that serum taken from an animal is almost always sterile, but that chyle is rarely so. As a rule, three or four hours after a meal a considerable number of bacteria are present in the chyle, and the numbers vary directly as the amount of food given.

"Words of cheer are words of help; words of gloom are words of harm. There is a bright and a dark side to every phase of life and to every hour of time. If we speak of the bright side, we bring the brightness into prominence; if we speak of the dark side, we deepen its shadows. It is in our power to help or hinder by a word any person with whom we have any dealings. A look or word can help or harm our fellows. It is for us to give cheer or gloom as we pass on our way through life, and we are accordingly responsible for the result of our influence."

NEWS AND MISCELLANY.

A Delightful Sail on the Broad Chesapeake.

Sunday Excursion to Bay Ridge.

If you want to spend a pleasant Sunday, and get a new set of nerves for the following week, go to Bay Ridge Sunday, August 4th. Everything is bright, healthy and rest-inviting at this beautiful bay-side resort.

No intoxicating liquors are allowed on the boat or grounds.

A special sacred concert by the military band and other entertainment, will be provided by the Company.

A spacious Cafe, where excellent meals are servedat reasonable rates, is located immediately in front of the band stand.

Only one more date.

We give below a list of stations showing time of special trains and rates.

Philadelphia, 7.10, $1.50; Chester, 7.30, $1.25; Wilmington, Delaware avenue, 7.50, $1.00; Wilmington, Market street, 7.20, $1.00; Kiamensie, 7.36, $1.00; Newark, 7.50, $1.00; Singerly, 8.00, $1.00; Havre de Grace, 8.30, $1.00; Van Bibber, 8.53, .90; Canton Wharf, (Balto.) 9.35 a. m.

Correspondingly low rates from other points.—2t.